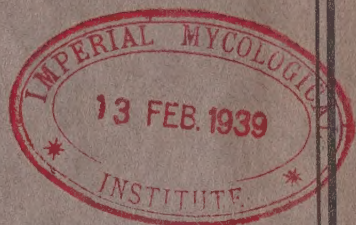


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NIGERIA



ANNUAL REPORT
ON THE
Agricultural Department
FOR THE YEAR
1937

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THE 1937-38 SEASON.

1. Reports from all agricultural stations throughout Nigeria show that the rainfall in 1937 was below average. In the Southern Provinces there was a lack of rain during the early part of the season which resulted in very low yields of early maize, and handicapped the progress of palm planting. The rainfall was, however, sufficient for the yam crop and heavy rains later on ensured a good cassava crop so that there was no shortage of food. In the Northern Provinces the season was characterised by late planting rains, after which, the rainfall, though lighter than usual, was well distributed. The lateness of the rains did not affect the millet and guinea corn crops, and food is therefore plentiful. Guinea corn yields as judged by the crops on our own farms were well above average; at Samaru and Shika they were the best ever recorded. As the farmer pays little attention to money crops until his food crops are well established the planting of cotton and groundnuts was seriously delayed, and the yield of groundnuts in particular was adversely affected. Groundnuts however yielded badly on our own farms where every effort was made to plant them as early as possible. Cotton which was planted in good time yielded well, but much of it was planted too late to produce even an average yield. At Samaru owing to absence of water logging the yields of cotton were considerably above average.

LOCUSTS.

2. From the records maintained by the Senior Entomologist it appears that there was an increase in the number of flying swarms in 1937, the number actually reported being between 400 and 500 more than in 1936. This increase was partly due to the exceptionally late breeding season in the Autumn of 1936 which resulted in many swarms of young adults being present in Nigeria in the early part of 1937. Damage to crops was more extensive than in 1936 but really serious damage was reported only from parts of the Bornu Province. In addition to the annual patrol of the Lake Chad Area, the Senior Entomologist undertook a survey of certain marshy areas in the Kano, Katsina and Sokoto Provinces in order to ascertain whether these swamps were breeding grounds for the Red Locust. No red locusts were however found during this survey, and only one was found in the Chad area.

TRADE.

EXTERNAL TRADE.

3. Following as it did a year in which there was an encouraging rise in the price of all primary products, 1937-38 proved to be a year of disappointments. Prices began to fall in May and continued to fall steadily throughout the year. This is shown in the table given below :—

AVERAGE MONTHLY PRICES OF NIGERIAN PRODUCE.

Month	Palm Oil. Average price Lagos.		Palm Kernels. Average price Lagos.		Cocoa, Grade II. Average price Lagos.		Groundnut. Average price Kano.	
	Soft.	Semi.						
	£ s. d.	£ s. d.	£ s. d.		£ s. d.		£ s. d.	
April, 1937 ..	16 7 6	13 12 6	11 1 3		—		7 5 0	
May, 1937 ..	12 7 0	9 12 0	9 3 0		—		6 18 0	
June, 1937 ..	12 18 2	10 3 2	8 6 3		—		6 10 0	
July, 1937 ..	13 10 0	10 15 0	8 6 3		—		6 10 0	
August, 1937 ..	12 9 10	9 13 0	7 16 0		—		—	
September, 1937	10 5 10	7 5 10	6 16 8		—		—	
October, 1937..	11 1 3	7 16 3	7 14 5		19 16 6		6 10 0	
November, 1937	8 14 6	5 7 6	7 0 0		18 4 0		4 9 6	
December, 1937	8 11 8	5 6 8	7 4 2		15 5 6		5 0 0	
January, 1938	8 14 6	5 9 6	7 0 9		16 8 9		4 10 0	
February, 1938	8 2 6	5 0 0	6 7 6		16 10 6		3 16 11	
March, 1938 ..	8 5 0	5 5 0	6 7 6		16 9 2		3 10 0	

4. The effect of this fall in prices on the exports of palm oil and palm kernels is shown by the following figures.

TONNAGE OF PALM OIL AND PALM KERNELS PASSED FOR EXPORT IN APRIL, 1937
TO MARCH, 1938, COMPARED WITH THE SAME PERIOD IN 1936-37.

	1937-38	1936-37	Decrease
Palm Oil	129,162 tons	162,788 tons	—33,176 tons
Palm Kernels	305,462 „	346,142 „	—30,680 „

5. The fall in price also seriously reduced the exports of both groundnuts and American Cotton. The exports of the latter falling from 39,189 bales in 1936-37, to 22,184 bales. Railings of groundnuts in 1936-37 (1st October-30th September) were 304,547 tons, but for the same period in 1937-38 it is unlikely that they will exceed 210,000 tons. With a price of from £3 to £4 in Kano, owing to the cost of transport the price which could be offered in the more distant places was extremely small, and very little trade was done. The purchases in the Bauchi Province for example fell from 15,000 tons last year to only 4,000 tons. Reports from Bauchi indicate however that the surplus nuts were crushed for oil for internal trade.

INTERNAL TRADE.

6. Fortunately the prosperity of the people of Nigeria is by no means entirely dependent on the quantity of produce exported. There is in Nigeria a flourishing internal trade which is steadily developing, and which has undoubtedly been greatly stimulated by low produce prices in recent years. It is probably true to say that the only people who suffered any serious hardship owing to the fall in prices during the year were those who mainly depended on the production of purely export crops, e.g., the producers of cocoa, of hard palm oil, and in some parts of the Kano Province of groundnuts.

7. Nigeria is such a vast country and the North and South are so different agriculturally that there is great scope for the interchange of produce between North and South. As this internal trade is mainly, though by no means entirely, concerned with foodstuffs and as the main object of all our Agricultural improvements is to ensure an adequate food supply and improve the diet of the people, it is obviously one of the duties of the Agricultural Department to investigate it, and to foster it as much as possible, for it is capable of almost unlimited extension and in many areas often offers the farmer a better return for his labour than the production of crops purely for the export markets. The returns from our own farms in the Northern Provinces showed for example that in 1937-38 guinea corn

was a much more profitable crop than either cotton or groundnuts. This internal trade from our point of view is not spectacular, and it is by no means easy to ascertain the facts about it, but it is of great importance to the people. Recent developments which are worthy of note are the steady increase of consignments of fruit and coconuts from the South to the North, the trade in fresh vegetables from Kano to the South, in green ginger from Southern Zaria, and the trade in edible palm oil from Onitsha to Lagos.

8. In general it may be said that the North supplies the South with meat, the middle belt supplies the South with yams and corn, and the South supplies both the North and middle belts with palm oil, kola nuts and fruit. The farmers of the Ilorin Province have for many years depended almost entirely on the internal trade in foodstuffs for their prosperity, and all efforts to get them to grow produce for export have failed completely. In this connection it is interesting to note that over 1,000 tons of yams, 400 tons of beans, and 200 tons of locust beans are railed from stations in the Ilorin Province each year and 300 tons of onions are railed from Jebba.

PRODUCE INSPECTION.

PRODUCE INSPECTION STAFF.

9. Lack of European staff handicapped the work of the Produce Inspection section throughout most of the year. Invalidings were heavier than usual and it was not until January, 1938, that the first of the four vacancies were filled. In spite of this handicap the Inspection service was satisfactorily and efficiently carried on. In order to provide an adequate staff of examiners for Groundnut Inspection in the North and for the Eastern and Central Areas where several new stations had been opened, the number of examiners was increased from 312 to 329. It is pleasing to be able to record a real improvement on the work of the African Examiners. The number who failed either to earn increments or to pass their efficiency bar was fewer than in previous years, and the number of appointments terminated was the lowest since the inception of the present system of Produce Inspection. In 1935-36 an attempt was made to improve the type of examiner by the appointment of eight boys from the Government College, Ibadan. Of these boys, seven are still in the section, only one having proved to be unsatisfactory. All reports show that they are doing excellent work and their smartness, superior intelligence and efficiency have been commented upon by all Inspectors under whom they have worked.

10. In order to meet the changed conditions caused by the introduction of Groundnut Inspection and the extension of the service to the Cameroons several areas were re-organised and the offices of the Superintending Inspectors of Produce at Lagos and Port Harcourt respectively were amalgamated. Both Chief Inspectors of Produce now live at Lagos and the administration of the whole section is now centralised there. This re-organisation has effected a considerable reduction in the clerical work which formerly devolved upon the Assistant Director of Agriculture and ensures that one of the Chief Inspectors of Produce is always in close touch with the headquarters of the Department.

11. No major complaints have been received from the firms either locally or from Europe, but a strike was engineered by the Ijebu-Ode Produce Traders Union as a protest against the methods adopted by one Inspector. The underlying causes of this strike were most carefully investigated by the Resident and the complaints against the Inspector were found to be without foundation.

COCOA GRADING.

12. The grading of the main cocoa crop for the Western Provinces in recent years is given in the following table. By main crop is meant all cocoa graded during the period 1st October to the end of February which weighed over 10½ oz. (11 oz. prior to 1935-36) per 300 beans.

GRADING OF MAIN CROP COCOA—WESTERN PROVINCES.

Year	Grade I per cent	Grade II per cent	Grade III per cent	Total Main Crop tons
1932-33	18	72.43	9.51	53,632
1933-34	17.27	73.40	9.32	47,457
1934-35	26.98	67.96	5	56,214
1935-36	29.51	69.44	1	68,377
1936-37	19.35	80.23	0.42	80,144
1937-38	21.93	77.76	0.30	70,890

The total Nigerian main crop passed for export in 1936-37 including the cocoa produced in the Eastern Provinces amounted to 71,599 tons and was graded as follows :—

Grade I	16,150 tons	22.56%
Grade II	55,210 „	77.11%
Grade III	239 „	0.34%

13. As always the bulk of the crop was Grade II but as compared with the previous season there was a small increase in the percentage of Grade I. All Grade II cocoa must contain less than 8% defective beans and less than 5% mouldy beans, but for our own information the cocoa is also classified according to its content of slaty beans. The classification of Grade II calculated as percentages of the whole crop during the last two years has been as follows :—

	CLASS B <i>Less than 10% Slaty</i>	C <i>11 to 15% Slaty</i>	D <i>16 to 20% Slaty</i>	E <i>21 to 30% Slaty</i>	F <i>No limit to Slaty</i>
1936-37	10.97	15.67	17.47	24.97	10.42
1937-38	4.00	11.34	18.63	30.08	11.65

As the quantity of Grade III is now negligible, almost the whole of the crop contains less than 30% of slaty beans.

14. There is now very little incentive to the producers to produce Grade I cocoa ; except for two weeks during the early part of the season when it was £1 per ton, the premium for Grade I over Grade II never exceeded 15s. per ton. The small increase in Grade I is therefore particularly pleasing for it shows that the producers know the way to produce high quality cocoa when they wish to do so. Although the average price for the season was slightly above that of several past seasons, after the high price paid in 1936-37 it was very disappointing. The average monthly Lagos price for Grade II cocoa in recent years is given below :—

AVERAGE MONTHLY PRICE, GRADE II COCOA, LAGOS.

	1932-33	1933-34	1934-35	1935-36	1936-37	1937-38
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
October	17 13 6	12 6 10	12 9 1	16 9 10	30 10 2	19 16 6
November	17 16 0	12 1 7	13 6 11	16 6 1	34 18 2	18 4 0
December	17 15 0	10 12 3	14 13 8	16 18 8	42 5 2	15 5 6
January	16 9 9	12 9 10	16 14 4	17 13 2	45 1 9	16 8 9
February	15 18 0	16 17 11	16 1 11	18 5 0	38 14 5	16 9 2

In spite of the low price and a good deal of agitation on the part of the Produce Buyers Union there was no attempt to hold up the crop which was marketed in an orderly manner throughout the season.

INSPECTION OF GROUNDNUTS.

15. The scheme for the inspection of groundnuts which was inaugurated in December, 1936, was more than justified by an important change which was made in the Liverpool contract for West African Groundnut Kernels (No. 34) in August, 1937, under which groundnuts instead of being sold on a "fair average quality" basis are now sold on a purity basis. The price quoted is now the price of 100% pure nuts and a deduction is made according to the percentage of impurities. Previously, provided that the nuts were of exportable quality as defined by the regulations, it made no difference to the final sale price whether the groundnuts were 100% pure or contained the full percentage of impurities allowed by the regulations. The effect of this change is aptly described by the following quotation from a letter received from one of the main buying firms :—

"The change in the contract brings about what the merchants desire, and the Agricultural Department can therefore go on with their campaign for improving the purity of groundnuts in the certain knowledge that it will pay the country handsomely for such improvement to take place".

16. On the recommendation of the Advisory Committee, before the 1937-38 season commenced, the regulations were amended to reduce the impurities permitted from 2% to $1\frac{1}{2}\%$ of which mineral matter is not to exceed 0.1%. During the early part of the season some trouble was experienced from the marketing of wet groundnuts but this practice decreased rapidly as a result of one or two successful prosecutions. At a recent meeting of the Advisory Committee the members unanimously declared that the improvement effected by the inspection scheme was most marked, and that the quality of Nigerian Groundnuts was now satisfactory.

STAFF.

EUROPEAN STAFF.

17. A second post of Principal Agricultural Officer has been created and the establishment of Agricultural Officers increased by seven. There has, nevertheless, been a marked shortage of staff during the year owing to certain vacancies remaining unfilled, to the arrangement whereby Nigeria now provides the Agricultural staff for the Gambia and to an unusual amount of illness and the extension programme has had to be curtailed ; in all the main branches of our work, however, satisfactory progress has been maintained.

AFRICAN STAFF.

18. The re-organisation of the African Staff was completed during the year. There are now two grades for African Assistants, namely a senior grade for those who have completed a full course at the Higher College at Yaba and a junior Technical Grade for young men who are in possession of a Middle IV Certificate or better, but who have not obtained the Higher College Diploma. The Senior Grade provides a very excellent career for men who are prepared to go in for Agriculture for it enables them to rise to the post of Assistant Agricultural Officers on a scale of £400-20-460, with the possibility of further advancement to £560 for really outstanding men. The maximum of the Junior Scale is £220 but provision is made for the transfer of men who display outstanding ability to the Senior Scale. During the re-organisation the opportunity was taken of promoting some of our best men and of rectifying some of the hardship caused by lack of promotion during the depression.

19. The need for trained African Staff is still very pressing. Nigeria is an agricultural country and there is vast scope for the spread of such improvements as mixed farming, palm planting, etc., but it is quite

certain that the country will never be able to afford enough European Agricultural Officers to bring these improvements to every farmer, and to supervise each one in the early stages. The final success of our work must therefore depend on African Staff and at this stage the training of such staff is the most important of all our activities. This statement refers not only to the training which is given in our Agricultural Schools but also to the subsequent training by which African Assistants are taught gradually to accept greater and greater responsibilities. The success of one or two of the senior members of the existing African Staff shows that Africans are quite capable of undertaking many of the duties now performed by Agricultural Officers. Every effort is therefore being made to develop the African Staff, in the hope that in a few years time extension to new areas will be possible without increasing the establishment of Europeans, for it should be possible for Africans to take charge of farm centres and of much of our extension work, thus enabling each European Agricultural Officer to supervise a much wider area.

AGRICULTURAL SCHOOLS.

20. Since the inception of the Yaba Higher College the only course held at the Ibadan School has been the Diploma Course for Yaba Students. A new Class of five of these has just completed the first year of the course with very promising results. The need for more African Staff has resulted in the inception of a second course for junior staff, and preparations have been made for the starting of a class of twenty-eight students early in the new financial year. I record with great pleasure that five Native Administrations have provided scholarships for this class; an innovation which is very much welcomed.

21. In the Southern Provinces there is no difficulty in obtaining candidates for the junior staff, but the position is not so satisfactory in the Northern Provinces where the need is more pressing than in the South. To provide an adequate staff for the Northern Provinces an output of not less than nine assistants per year is required from the Samaru School during the next few years, but as the Kaduna College is almost the only source of supply, there is no hope whatever that this number will be forthcoming.

22. The Samaru School in addition to the course for the junior staff also holds refresher courses for the existing Government and Native Administration staff, and also gives a practical course to the sons of farmers and others wishing to start mixed farming. In all these courses great stress is laid on the practical side of the work, and the students have their own farm and cattle. They are also kept in close touch with the work which is done on the main experimental farm. Arrangements have recently been made for the Samaru School to become a joint Forestry and Agricultural School. A Forestry Officer will be stationed at Samaru and will teach the forestry students purely forestry subjects while both sets of students will receive common teaching in such subjects as surveying, botany and chemistry. This is a very welcome innovation which cannot fail to be of benefit to both departments and will do much to develop the very excellent relations which already exist between the Forestry and Agricultural Departments. Both schools badly require improved housing conditions for the students, also facilities for housing a museum, for in teaching applied science nothing can take the place of actual specimens. The Samaru School also needs improved school buildings and library facilities.

EDUCATION AND AGRICULTURE.

23. The first of the courses for teachers held by the Education Department at Moor Plantation has been completed, and the teachers have returned to their schools, and are all starting to make school farms, on which they will demonstrate the farming methods which they learnt at

Ibadan. Although the whole scheme is under the Agricultural Education Officer, Agricultural Officers are assisting with both advice, and supervision of the farms. Two excellent school farms for teaching mixed farming have been commenced in the Niger Province. Arrangements for the course in practical mixed farming for farmers' sons at Kafin Soli near Katsina are now complete, and the first course has just commenced.

MAINTENANCE OF SOIL FERTILITY.

EXTENSION WORK WITH GREEN MANURING.

24. An attempt to commence extension work with green manuring in the Ogbomosho area of the Oyo Province was made in 1936. At that time some 100 farmers came forward and stated that they wished to give it a trial, but when it came to the point only thirty-seven actually planted the green manure and of these twenty-three either abandoned their plots or were not willing to continue in 1936. Of the fourteen who continued in 1937, five extended the system to other parts of their farm lands and three new men started, making seventeen in all. Two of these have since abandoned their plots. The remaining fifteen are well satisfied with the results and have announced their intention of continuing in 1938. It is interesting to note that six of the farmers who originally started and subsequently dropped out intend to start again. Although these figures are not very encouraging, we are still hopeful that more rapid development will take place if the present farms are continued successfully for a few years. Rotations have been modified to suit the requirements of individual farmers, and on the demonstration plots at Ogbomosho, Ede and Ibadan excellent crops have been grown, and good covers of mucuna established. On these demonstration plots our system is demonstrated alongside the ordinary native system, so that the local farmers can compare the crops grown under both systems. Little interest has been shown at Ede, but farmers have paid frequent visits to the plots at Ogbomosho and Ikirun.

EXPERIMENTAL WORK ON GREEN MANURING.

25. Our experience at Ogbomosho and also in the Benue Province has shown the need for modifying our experimental work in connection with green manuring. The experiments carried out at Ibadan during the last seventeen years have shown that, although changes are gradually taking place in the soil as a result of the various treatments—particularly an increase in acidity in those plots where green manures are buried green year after year—yet fertility can be maintained for long periods by means of green manures. In the Benue Province there is some evidence that fertility is beginning to fall after only eight years continuous cropping, but this is not surprising as the system which we are practising there depends almost entirely on a late season green manure crop and in that climate a good late cover is always difficult to establish and sometimes fails entirely.

26. The Moor Plantation experiments and the chemical studies which have accompanied them have given us a real knowledge of the problems of soil fertility in this part of Nigeria, and will form the basis of all future work in this connection. Our problem now is to adapt this knowledge to the needs of the peasant farmer. Both at Ibadan and in the Benue Province we have already started to tackle this problem. Our present rotations clearly entail too much labour for the ordinary farmer, and in the Benue Province we are therefore experimenting with pigeon pea fallows, the seed being broadcast through benniseed. These experiments have given promising results. Pigeon peas are edible, little labour is required to establish them, they are able to survive the dry season, and they successfully keep down spear grass (*Imperata arundinacea*). The experiments are therefore being continued for we have yet to learn the length of fallow required to maintain reasonable standard of soil fertility. At Ibadan it is clear that our rotations must include cassava, which is the main food crop

from Abeokuta southwards, and to make the system acceptable it must provide for mixed cropping. Attempts are therefore being made to establish such green manures as mucuna, pigeon peas, tephrosia, etc., through cassava, and to adapt green manuring to the various systems of mixed cropping which are practised locally. Some success has already been achieved on the Native Administration farm centre at Abeokuta where a rotation has been devised which not only includes all the crops normally grown by the local farmers but is also profitable in terms of cash.

27. In the Eastern Provinces the position is much the same as at this time last year, as regards the use of Calapagonium for maintaining fertility under a system of permanent cultivation, and it will probably be several years before a definite result is obtained. In the meantime the value of fallows of *Tephrosia candida* and *Acioa Barteri* for restoring fertility to these very poor soils having been definitely established, we are now studying the best method of establishing these plants and the length of fallow required.

FARM YARD MANURE : SOUTHERN PROVINCES.

28. Another year's work has again shown the value of farm yard manure on the poor soil in the Eastern Provinces, and the general indications from all experimental work to date point to the fact that of the methods so far tried farm yard manure promises to be the only one which will successfully maintain or increase fertility in an intensive cropping system in this part of Nigeria. The results so far obtained at Umuahia may be summarised as follows :—

Farm Yard Manure on Yams.—In all experiments farm yard manure has caused a substantial increase in the yield of yams. In a full scale experiment which was recently carried out dressings of two tons per acre and four tons per acre increased the yield by 47% and 77% respectively as compared with no manure. There is some indication that little additional benefit is derived from dressings in excess of four tons per acre, but the question of the optimum dressing require further investigation.

Maize.—Considerable increases in maize yields have been obtained by the use of farm yard manure but the increase have not been so striking as in the case of yams. Up to dressings of eight tons per acre which gave an increased yield of 110% as compared with no manure, the increase seems to rise steadily with the size of the dressing.

Calapagonium.—A dressing of four tons per acre caused a considerable improvement in the cover of *Calapagonium*.

MIXED FARMING : SOUTHERN PROVINCES.

29. The above results from Umuahia, and the comparatively slow progress which seems likely to be made with green manuring even in those areas where it has been proved to be effective, have led us to believe that a combination of both farm yard manure and green manuring (and possibly also of artificial manures) will be the ultimate solution of the soil fertility problem in the Southern Provinces. As farm yard manure can only be provided under a system of mixed farming the possibilities of such a system for the Southern Provinces are now being seriously investigated.

30. A preliminary survey of the position indicates that provided that mixed farming in the Southern Provinces is not necessarily regarded as synonymous with ploughing, it is by no means out of the question, although it admittedly bristles with problems. There are already large numbers of cattle, sheep, goats and pigs in the Southern Provinces, and these animals although small and dwarfish are capable of development both as a source of manure and of meat. The cattle have many points in common with the bigger animals which we have obtained from the Gold Coast for the Ilorin

stock farm, and it is quite certain that they can be improved, although improvement is not essential to their use as manure makers ; we need not therefore defer the commencement of this work until improvement has been effected. The first step is to persuade their owners to value their animals for agricultural purposes by demonstrating the value of the manure. This however can only be accomplished if farmers can be protected against undue losses from disease. The appointment of Veterinary Officers for the Southern Provinces is therefore an urgent necessity and is essential to the success of any attempt to work out a system of mixed farming.

31. In the Western Provinces a start has already been made by the establishment of a Unit farm at Moor Plantation as a part of the Ilorin Scheme and arrangements have been made for the head of cattle maintained there to be increased to enable us to study the management of livestock in connection with permanent crops such as oil palms, cocoa and coconuts. The evolution of a system of mixed farming for this area with local animals will not be difficult, as the soil is suitable for the production of all the food-stuffs required. We have already shown at Ibadan that if the right type of animal can be produced at Ilorin ploughing will be possible in this area. The two animals obtained from Ilorin have successfully cultivated a ten acre farm and have maintained perfect health. This work is being watched by the farmers with intense interest.

32. As mentioned in last year's report small herds of dwarf cattle and sheep have been established at Umuahia and some preliminary work has also been done with pigs. In the Eastern Provinces, however, where under present conditions it is almost impossible to grow suitable leguminous crops, feeding presents many problems, and ploughing is hardly a possibility. But since in this area the animals will not at present be called upon to work the need for superior feeding is not so great as where ploughing is possible ; the problem is therefore by no means insoluble. As already shown, however, the manure will be of even greater value than in the Western Provinces and the demand for meat in the Eastern Provinces is insatiable. Here again however the only hope of success is to protect the owners of livestock against losses from disease.

33. As and when funds permit, the study of mixed farming will be commenced on all our farms in the Southern Provinces and in due course the superior animals produced at Ilorin will be tested at each station. If they are a success under such varying conditions the possibility of using them for grading up the local dwarf cattle will of course be investigated.

EXPERIMENTS WITH ARTIFICIAL MANURES.

34. The effect of readily available phosphate on the Zaria soils was referred to in last year's report. This year an experiment was carried out at Kano to ascertain whether similar results would be obtained there on soils which are lighter, still more deficient in organic matter, and have a lower nitrogen content than the Zaria soils. The crop grown was millet, and the results which are very striking are given below :—

Average yield nine plots unmanured	381 lb. dry grain per acre
Average increase four plots unmanured with three tons Farm Yard Manure per acre ..	+222±33 lb. dry grain per acre
Average increase four plots manured with superphosphate equivalent to three tons Farm Yard Manure	+421±33 lb. dry grain per acre.

This experiment will be repeated with other crops this year and a test to ascertain whether there is any residual effect from the phosphate will also be carried out. The experiments carried out at Samaru to ascertain whether the availability of rock phosphate could be increased by incorporating it with the manure in the pens gave inconclusive results, but it will be repeated again under more favourable conditions.

MANURIAL VALUE OF ASHES.

35. In our efforts to increase the supply of manure available for the farmer we have been investigating the value of ashes and household refuse. Every native household has a refuse heap consisting of ashes, and partly ashed material, and it has been ascertained that a household consisting of, say, four adults and four children produce nearly two tons of this material annually. In 1936 an experiment, which will be continued for several years, was commenced at Samaru to ascertain the manurial value of this refuse; one ton per acre of refuse being tested against no manure. The result to date are as follows:—

<i>Year</i>	<i>Crop</i>	<i>No Manure</i>	<i>1 ton per acre</i>	<i>Standard Error</i>
1936 ..	Millet ..	392 lb. dry grain ..	+138 lb. dry grain ..	±80
1937 ..	Guinea corn	625 „ „ „ ..	+320 „ „ „ ..	±44

The application of one ton per acre of refuse thus gave a big increase in the yield of millet in 1936 and doubled the yield of guinea corn in 1937. It is therefore very valuable material and investigations as to the best method of conserving and using it will be continued.

CHEMICAL WORK.

36. The chemists have again co-operated very closely in all work in connection with soil fertility and many of our field experiments and other investigations have originated from the results of pot experiments and similar small scale trials carried out in their laboratories. At Moor Plantation, a preliminary soil survey of Nigeria has been completed and a soil map prepared by the Senior Chemist. Owing to the size of the country and the very great variation of the soil types the map must be regarded as a very approximate representation and it attempts only to portray the main types. In addition, several soil analyses have been carried out for the United Africa Company's estates and for the Forestry Department, and a survey made of the cacao soils in the Agege area. At Samaru, the chemist has been particularly associated with the experiments on the use of ground rock phosphate and other artificial fertilisers in conjunction with farmyard manure. He has also co-operated in the selection of sites for new farm centres from the soil point of view.

EROSION.

37. Although erosion is not the serious problem in Nigeria that it is in other parts of the tropics yet in certain localised areas it is undoubtedly taking place more rapidly than is desirable. Such an area is part of the Onitsha Province where gully erosion is rapidly becoming a serious matter. There are also parts of the Northern Provinces where both wind and sheet erosion are seriously affecting the fertility of the soil. In each area the primary cause is the same, namely that pressure of population has broken down the old system of rotational fallowing and in the absence of adequate supplies of manure the people know of no other system with which to replace it. They are therefore forced to attempt what is tantamount to permanent farming without manure. The Agricultural Department therefore holds the view that the most effective anti-erosion measure is a sound system of farming and it is on the evolution of such systems that all our efforts are concentrated.

38. The effect of wind erosion in the North has been much discussed in recent years, but there seems to be little or no experimental evidence on which to base such views as may be advanced. An experiment has therefore been laid down on the farm at Daura to ascertain the actual extent to which erosion is taking place, its effect on the soil and the effect of simple anti-erosion measures such as leaving weeds on the soil during the dry season, strip cropping, belts of pigeon peas and wind breaks.

39. With the more adequate funds which have been available during the last two years it has been possible to take steps for the more effective control of erosion on our own farms, and at both Samaru and Shika badly eroded areas are being protected by means of broad base terraces.

ANIMAL HUSBANDRY.

PROGRESS OF MIXED FARMING.

40. The progress made in introducing mixed farming in the Northern Provinces is shown in the following tables.

YEAR	No. started during the year	Failures during the year	Total continuing at the end of the year
1928 ..	3	—	3
1929 ..	9	5	7
1930 ..	13	3	17
1931 ..	31	4	44
1932 ..	71	7	108
1933 ..	84	19	173
1934 ..	139	14	298
1935 ..	348	25	621
1936 ..	(A) 474	41	(A) 1,054
1937 ..	445	66	1,433

Note.—(A) Last year's figure amended.

The distribution of mixed farmers among the various Emirates is given below :—

EMIRATE	No. at end of 1936 (30th Sept.)	No. started during 1937	Failures during 1937	No. at end of 1937 (30th Sept.)
Zaria	327	109	13	423
Birnin Gwari (B)	4	—	3	1
Kano	195	69	8	256
Kazaure	26	21	2	45
Gumel	17	11	2	26
Hadeija (B)	3	13	2	14
Bedde (A)	1	11	—	12
Katsina	239	99	9	329
Daura	112	60	2	170
Misau	1	2	—	3
Sokoto (B)	97	25	14	108
Sokoto (rice farmers)	12	11	—	23
Katagum	1	2	—	3
Argungu	1	—	1	—
Gwandu	14	—	10	4
Bida	1	—	—	1
Kontagora	1	3	—	4
Bauchi	2	8	—	10
Gombe	—	1	—	1
TOTALS	1,054	445	66	1,433

Notes.—(A) One in 1936 not previously reported.

(B) Totals in previous annual report incorrect.

41. For the first time since we commenced this work the number of new farmers who actually started was less than in the previous year, the number being 445 as compared with 474 in 1936-37. This, however, is not a serious matter for in the circumstances it is doubtful if we were wise to start as many new men as we did. There was no dearth of applicants and those who were started and received advances were therefore very carefully selected. The rapid rise in produce prices in 1936 was also reflected in a rise in the price of cattle, and the value of a good working beast rose to between £3 and £4 in the early part of 1937. When produce prices fell the price of cattle also gradually fell and a beast of similar quality can now be purchased for £2. As a result of this rise and fall in prices the farmers who started last year required a larger advance than is desirable, and had the fall in prices been foreseen in time it would probably have been wiser to have deferred starting new men until price stability had been reached again.

ADVANCES.

42. The table of outstanding advances which is given below shows the extent to which the high price of cattle affected the initial advances :—

EMIRATE	£10 or over	£8 to £10	£6 to £8	Under £6	Nothing	Total No. of Mixed Farmers.
Zaria	13	99	85	192	34	423
Birnin Gwari	—	—	—	1	—	1
Kano	32	56	54	95	19	256
Kazaure	—	16	15	12	2	45
Gumel	2	8	5	6	5	26
Hadeija	—	2	6	3	3	14
Bedde	—	—	—	10	2	12
Katsina	3	33	53	109	131	329
Daura	—	17	20	95	38	170
Sokoto (Gusau area)	10	18	6	24	20	78
Sokoto (Sokoto „)	—	4	2	14	10	30
Sokoto (Kworre „)	11	7	2	3	—	23
Argungu	—	—	—	—	—	—
Gwandu	—	3	1	—	—	4
Bida	—	—	—	—	1	1
Kontagora	—	3	—	—	1	4
Bauchi	—	1	3	4	2	10
Gombe	—	—	—	—	1	1
Misau	—	—	—	—	3	3
Katagum	—	—	—	1	2	3
TOTALS 1937-38	71	267	252	569	274	1,433
TOTALS 1936-37	18	68	243	573	151	1,053

43. In the areas where mixed farming is now established we are gradually tightening up the advance system in order to ensure that only those farmers who are really keen and who mean to make a success of mixed farming are started. There is no doubt whatever that the fall in produce prices caused a serious reduction in the income of the peasant farmer. This is confirmed by the returns from all our demonstration farms, but these returns also show that those farmers who depended most on export crops suffered most severely. Many farmers however have had genuine difficulty in finding the cash for the repayment of advances and considerable latitude has therefore been allowed, each individual case being considered on its merits.

TYPE OF FARMER.

44. The following table shows that there was again a satisfactory increase in the number of peasant farmers. In the Katsina Province 64% of the new men were of this type.

EMIRATE	Emirs and N.A. Executive Officials	Village Heads	Peasant Farmers	Others	Total at end of 1937. (30th September).
Zaria	17	66	335	5	423
Birnin Gwari	—	—	1	—	1
Kano	20	105	96	35	256
Kazaure	5	10	30	—	45
Gumel	7	14	3	2	26
Hadeija	5	9	—	—	14
Bedde	6	6	—	—	12
Katsina	21	141	113	54	329
Daura	7	55	89	19	170
Sokoto	29	31	34	14	108
Sokoto (rice farmers)	1	1	21	—	32
Argungu	—	—	—	—	—
Gwandu	3	—	1	—	4
Bida	1	—	—	—	1
Kontagora	2	—	2	—	4
Bauchi	8	2	—	—	10
Gombe	1	—	—	—	1
Misau	3	—	—	—	3
Katagun	3	—	—	—	3
TOTALS	139	440	725	129	1,433

CATTLE POOLS.

45. While it is hoped that eventually we shall be able to devise a better system, under present conditions the system of cattle pools seems to be the only solution of the problem of collecting, training and distributing cattle to mixed farmers. Every effort is made to ensure that the expenditure and revenue of these pools as nearly as possible balance each other, but during the year under review the pools passed through a difficult phase. Cattle had to be purchased during the rainy season of 1937 when the price was high, but by the time these beasts were issued to farmers their value was less than the price which was paid for them. Farmers who are this year obtaining their cattle from the pools are therefore being asked to pay rather more than the present price of similar animals in the open market. While we are anxious to supply cattle as cheaply as possible we do not regard this as a serious hardship, as it must be regarded as the price which the farmer has to pay for being supplied with cattle which are well trained and have been immunised against rinderpest, etc. It is, however, a difficult matter in agricultural extension work to maintain the correct balance between progress and consolidation and in this instance we have now learnt from experience that consolidation would probably have been the wiser move. In order to obtain cheap animals a certain number of very young or unsuitable beasts were purchased, which subsequently had to be sold at a loss. On the whole, however, the losses on the cattle pools were remarkably small.

STALL FEEDING.

46. With a view to ascertaining whether cattle could be kept entirely on the farm throughout the year without resorting to bush grazing an experiment with four working beasts was started at Maigana in June, 1937. The animals performed the same work as other animals on the farm but all food was fed to them in the pen. The results were very satisfactory. The beasts maintained excellent health and condition and the cost of cutting fodder, watering and feeding worked out at 1.5 man hours per day. This amount of labour is not excessive and is well repaid by the extra amount of manure produced, each beast producing between four and five tons. The system of feeding adopted depends upon a supply of sugar cane tops and swamp grasses so that it can only be practised in areas where swamp land is available, but now that the study of this important problem has been commenced the results will be followed up and an attempt will be made to adapt them to other conditions.

IMPLEMENTS.

47. As it is now clear that carts made from imported wheels and axles are beyond the reach of the ordinary farmer the evolution at Maigana of a simple cart with solid wheels which can be made for between £1 and 25s. is a matter of some importance especially in connection with the spreading of manure. There is a tendency for the farmer to save himself trouble by spreading all his manure on the fields in the vicinity of his cattle shed, and neglecting the more distant fields entirely. It is hoped that this simple cart will do something towards correcting this tendency.

IMPROVEMENT OF COWS.

48. The table given below shows the progress made in improving the milk yield of the herds at the Shika Stock Farm and at Samaru.

YEAR	No. of complete lactations	Average period between calves	Average No. of days in milk	Average yield per day between calves
SHUWA HERD.				
1929	11	419	250	4.78
1934	40	410	290	5.08
1935	45	389	296	5.86
1936	52	372	262	5.39
1937	61	373	249	5.00
WHITE FULANI HERD.				
1930	3	391	168	2.42
1934	42	406	261	4.76
1935	47	363	278	6.52
1936	58	352	227	6.25
1937	51	354	235	7.03
GUDALI (SOKOTO) HERD				
1933	3	—	—	2.42
1934	11	541	288	3.81
1935	19	369	235	5.72
1936	25	373	245	6.29
1937	24	357	242	8.40

49. In the White Fulani and Gudali herds the milk yield as shown in the last column moves steadily upwards and the Gudali herd has attained a very high average level. This high figure however represents the lactations of twenty-four mature cows all at the crest of their reproductive capacity, and themselves the survivors of a policy of rigorous culling. The continued improvement in the White Fulani herd is particularly satisfactory because it shows that none of our first four experimental sires threw really bad milkers. In this we were fortunate, as these bulls were purchased from the Fulani and we knew very little about their history. We have however reached a stage when a temporary set-back must sometimes be expected. Such a set-back which has now occurred in the Shuwa herd is not indicative of a decline in the efficiency of management. The main causes are a further outbreak of contagious abortion, and the fact that, as mentioned in last year's report, heifers were formerly allowed to breed as soon as they were sexually mature. The result of this policy of mating undeveloped heifers is now reflected in low milk yields in the first lactations. If abortions and first lactations are excluded from the figures of the Shuwa herd the yield per day between calves is 5.54 lb.

50. Our steadily increasing knowledge of feeding and management continues to bear fruit. In the White Fulani and Gudali herds calving now occurs regularly at intervals of less than twelve months, calf mortality is no longer such a serious problem as formerly, and in spite of higher milk yields we are now able to maintain the weight of our animals throughout the dry season. This is shown in the following table which gives the weight increases over the last four years during the months January to April when the natural grazing is poorest.

AVERAGE TOTAL INCREASE OF WEIGHT IN LB. PER HEAD
DURING JANUARY TO APRIL INCLUSIVE.

YEAR	Sokoto Milk Cows	Sokoto Dry Cows	Sokoto Heifers	Fulani Milk Cows	Fulani Dry Cows	Fulani Heifers
1934	—19.9	+ 2.6	—	—25.3	—18.5	—
1935	+ 2.1	+49.5	—	—10.9	+66.4	+63.6
1936	—17.1	+31.0	+ 22.6	—18.9	+21.0	+35.2
1937	+35.6	+65.5	+135.4	+34.7	+70.9	+91.4

EXPERIMENTAL WORK.

51. One major experiment was initiated at Shika during the year. Its purpose is to ascertain the effect of castration on body conformation, rate of growth, ability to work, and temperament. Very little work seems to have been done on this aspect of animal management, but it is of considerable importance to us and the results when available should be informative. The experiment on the feeding of minerals started last year is being continued.

FODDERS.

52. The Uba canes, wild canes and sweet potatoes obtained from the West Indies last year are being multiplied up and experimental work under a wide variety of conditions will be commenced as soon as sufficient planting material is available. Elephant grass, guinea grass, gamba grass, and native sugar canes are also being studied on most farms. A small plot of gamba at Maigana produced some 8,700 pounds of green fodder during the year, the last cut being made as late as the middle of December. Investigations into the best method of growing and utilising pigeon peas are being actively continued, but it is clear that we still have much to learn in this connection. It is, however, noteworthy that pigeon peas survived the dry season on the very poor sandy soils at Birnin Kebbi. The six new strains obtained from India are very different from our local strains and from one another. They are now being multiplied for further experimental work.

THE ILORIN STOCK FARM.

53. The scheme for investigating the possibility of introducing some form of mixed farming into the middle belt, the capital cost of which was provided by the Colonial Development Fund envisaged a central stock farm at Ilorin and twenty unit farms at various places in the Ilorin Province. During the year the central farm was laid out, and the buildings completed. Three unit farms were also started in the Province and one at Moor Plantation which is outside the middle belt. Sites were selected for eight other unit farms in co-operation with the Senior Entomologist. The latter made three tsetse surveys of each proposed site and after the third survey a method of comparing the tsetse abundance in the different localities was devised. The farms were then classified according to the "fly index". The scheme also envisaged the purchase of some thirty more bulls and sixty cows from the Gold Coast, or from the Gambia and a small herd of the Malinke breed from French Guinea. Here however we have had a set-back. The Government of the Gambia was able to obtain only ten bulls and two cows and the officer sent to the Gold Coast to complete the purchases there was not allowed to visit the Northern Territories where the bulls of the type we require are to be found. He was informed that owing to the fact that the Native Administrations were buying cattle for their own stock farms none could be spared for Nigeria. A request that we might be allowed to purchase even a very few met with the same response. The French Authorities in Dahomey, however, were most helpful and we were able to buy twenty-one cows there; but we are still very handicapped by the lack of bulls of the Gold Coast type.

54. This lack of bulls has retarded the rate at which we can start the unit farms. As a temporary expedient we have started the existing unit farms with Ketaku bulls from Kaiama. These animals have some Zebu blood, and while some of them have remained quite fit they do not stand up to the work in the same satisfactory way as the Gold Coast bulls do. In all ten bulls and two heifers were purchased from the Gambia, nine bulls and twelve cows and heifers from the Gold Coast and twenty-one cows and heifers from Dahomey. The purchases from the Gold Coast, however, were of an inferior type, and it is doubtful whether the young bulls will ever be suitable for work.

55. The four Gold Coast bulls which we already possess have done extremely well. They have worked hard and regularly on a concentrate ration of three pounds per day. One team averaged ninety hours work per month from July to September and the four bulls sired twenty-eight calves. Rises in temperature have occurred from time to time in all the Gold Coast animals but none of them have required treatment. A young Gold Coast bull which was bred on the Ilorin farm, and which was transferred to Ibadan has remained quite fit in spite of a fairly high incidence of tsetse fly on the Ibadan farm. On the other hand 75% of the animals at Ilorin which are known to have Zebu blood in them have had to be treated with tartar emetic.

GOATS.

56. With the object of ascertaining the extent to which increased use can be made of goats in our system of mixed farming small herds are now maintained on all our main farms, but so far progress has been handicapped by the incidence of disease. At Birnin Kebbi losses from pleuro pneumonia have been severe and intestinal worms are a continual source of trouble. These matters are however receiving the attention of the Veterinary Department, and we for our part are testing various methods of housing and management, including complete stall feeding. The possibility of improving the milk yield of the local goats is also receiving attention especially at Kano. In the close farmed area around Kano where the farms are very small the people have on their own evolved a system of mixed farming which cannot easily be improved, but the provision of a milk supply would be a genuine improvement. We have already worked out a system for keeping cows on these small farms and extension work on a small scale is about to begin. But cows are expensive and difficult to obtain and we should feel in a stronger position if we could evolve a superior type of milking goat. Disease, however, is the limiting factor at present.

57. Provided that the health of the herd of goats can be satisfactorily maintained there is no doubt that the keeping of these animals can greatly increase the wealth of, and provide a steady income for the farmer, especially at times when produce prices are low. This has been proved on one of the unit farms at Kafin Soli on which goats have been used to replace a cow as manure makers. The figures for this herd are as follows :—

	No.	Purchase Price April, 1936	No.	Valuation December, 1936	No.	Valuation December, 1937
	7	£ s. d. 2 9 0	15	£ s. d. 3 19 0	29	£ s. d. 6 5 0
Sold during the year ..	—	—		—	7	1 13 0
		2 9 0		3 19 0		7 18 0

The valuations each year have been cautious and of the twenty-nine valued on 31st December, 1937, four have already been sold at prices exceeding the valuation. On the demonstration farm at Daura a similar sum was

realised by the sale of goats. With regard to manure, Kafin Soli experience shows that a small herd of goats can more than replace a cow. The above herd produced three and half tons in 1936-37 and it is estimated that the 1937-38 figure will exceed eight tons. While goats are within the reach of the smallest farmer they cannot entirely replace the cow in the ideal system of mixed farming as they cannot breed replacements for the working bullocks.

DONKEYS.

58. At both Birnin Kebbi and Kano donkeys have again proved useful workers for use on small farms, but modifications of both harness and implements are required. As with goats the disease question is an important factor when the animals are kept on the farm.

POULTRY.

59. Our work with poultry has been mainly confined to increasing the output of cockerels from our own stations, and this has necessitated a considerable amount of experimental work on housing and feeding. Poultry pens are now established at Agege, Moor Plantation, Onitsha and Benin and new blood is periodically sent to each of these stations from Agege to which farm all introductions are sent on arrival.

60. Feeding experiments have been carried out at Agege with both imported and local foods. These experiments were started primarily to increase the output of eggs during the hatching season, and to observe what improvements could be effected in the production of chickens as a result of better feeding. In the first instance an imported proprietary laying mash was employed, and greatly increased egg production resulted from its use. It was realised, however, that the cost of this food was inordinately high for the ordinary poultry keeper and an attempt was, therefore, made to work out rations based on the accepted principles of scientific poultry feeding, but composed entirely of foodstuffs obtainable locally. The following two rations have been under trial.

	" A "		" B "	
Scratch feed	{ Maize	30 parts	Maize	30 parts
	{ Gari	30 "	Gari	30 "
	{ Maize Bran	30 "	Maize Bran	30 "
Mash	{ Mucuna Leaf Meal*	5 "	Mucuna Leaf Meal*	5 "
	{ Bean Meal	5 "	Stockfish	5 "

* This is made from the green leaves of the Mucuna bean. The leaves are dried in the sun and rubbed through a fine sieve.

During the short period in which the trial has been in progress ration B has given results approximately equal to those obtained from the imported poultry food, and ration A appears to be only slightly inferior. Whilst it is premature to advocate any definite claims at present, it would certainly appear that there is considerable scope for effecting improvement in egg production with foodstuffs obtained locally and at very much reduced costs as the following comparison shows :—

Approximate cost of imported food (excluding scratch feed)	.. .. .	19s. 0d. per cwt.
Approximate cost of diet A (including scratch feed)	.. .. .	6s. 3d. a cwt.
Approximate cost of diet B (including scratch feed)	.. .. .	9s. 4d. a cwt.

61. All birds at Ibadan and Agege were inoculated against both fowl typhoid and fowl pox by the Veterinary Department and I wish to thank the Department for this assistance.

THE OIL PALM INDUSTRY.

INVESTIGATION BY ADMINISTRATIVE OFFICERS.

62. While we still hold the view that if only we can persuade the African farmer to adopt efficient methods for the cultivation of the oil palm and the extraction of his oil the native palm oil industry will be able to hold its own, yet we fully realise both that the growing competition from Sumatra and Malaya, the competition of other oils and fats and, most recently of all, the reported production of synthetic soap, each year increase the urgency of the problem and that the difficulties in the way of improving production are very great. Some of these difficulties have recently been investigated by three Administrative Officers who were specially detailed by the Government for the purpose. This was an important step which will most certainly have extremely useful results. Pending the publication of the reports of these officers no useful purpose will be served by enlarging further on this subject.

OIL PALM RESEARCH STATION.

63. In spite of the urgency of the problem much research which must take several years before it can produce results remains to be done. With the resources at our disposal it has hitherto been possible to carry out only a limited number of cultural or manurial experiments in Nigeria, and many of those which have been carried out were, owing to lack of facilities, on too small a scale to enable a high degree of reliance to be placed on the results. Approval has now been obtained for the establishment of an oil palm research station of sufficient size to enable the plant breeder to carry out a really comprehensive programme of improvement by selection, and the subsequent multiplication of the best types. In order that we might profit by the experience and knowledge gained by Dr. Beirnaert and his staff at the Yangambi station in the Belgian Congo before starting our own station, one of the plant breeders, Mr. F. W. Toovey, was sent to the Belgian Congo to make a careful study of the work which has already been done there. Mr. Toovey returned from this visit in March, 1938, and his report will shortly be submitted to the Government. In the meantime detailed plans for the programme of work on the new station are being drawn up in the light of the knowledge so obtained.

64. A further important development is the co-operation which has been forthcoming from the United Africa Company's estates. A programme of experimental work comprising both manurial and cultural experiments has been drawn up for each estate in consultation with us and some of the experiments have already been commenced. These experiments are on a much bigger scale than any which have hitherto been attempted in Nigeria, and they are being carried out entirely at the expense of the Company. The importance of this contribution towards the solution of our problems can hardly be overestimated. We hope later on to repeat some of the experiments at our own station, so that eventually we shall have information on the effect of the various treatments under a wide diversity of soil and climatic conditions. I wish to thank both the United Africa Company, Ltd., for undertaking this work, and the various managers for so willingly co-operating with us in a programme which must add greatly to their responsibilities.

PALM PLANTING.

65. The following tables show the total area of palm plantations made and maintained by African owners since this work was started in 1928. Plots which are not satisfactorily maintained or have subsequently been abandoned are not included in these figures.

CULTIVATED OIL PALM PLANTING IN NATIVE OWNERSHIP.

					Total No. of owners	Total area acres
On December 31st,	1928	..	..	..	6	21
"	1929	..	..	..	27	119
"	1930	..	..	..	53	236
"	1931	..	..	..	85	352
"	1932	..	..	..	218	691
"	1933	..	..	..	382	1,014
"	1934	..	..	..	704	1,457
"	1935	..	..	..	1,382	2,498
"	1936	..	..	..	2,278	4,172
"	1937	..	..	..	3,557	6,588

The progress made in each Province is shown below :—

OIL PALM PLOTS.

Province	1928-36		1937		1928-37		1928-37	
	Net Total		New Owners	New Plots Extensions Acres	Abandoned		Net Total	
	Owners	Acres			Owners	Acres	Owners	Acres
Benin ..	1,050	2,595	601	1,542	109	174	1,584	4,025
Warri ..	51*	121*	27	61	3	9	78	182
Owerri ..	499	605	368	541	57	58	838	1,123
Calabar ..	275*	340*	198	206	89	112	429	486
Onitsha ..	284	354	182	209	68	55	428	535
Ogoja ..	24*	19*	10	9	7	6	30	22
Colony ..	3	2	4	2	—	—	7	4
Abeokuta ..	18	14	57	40	6	7	60	47
Ijebu ..	1	2	5	2	1	3	6	3
Oyo ..	33	42	24	63	26	26	49	101
Ondo ..	1	3	—	—	—	—	1	3
Totals	2,248	4,108	1,476	2,675	366	450	3,519	6,531
PALM GROVE REPLACEMENT.								
Benin ..	6	15	—	—	8	27	5	13
Owerri ..	4	16*	—	—	1	3	3	13
Calabar ..	27*	54*	7	7	11	34	30	31
Totals	28	64	7	7	20	64	38	57
GRAND TOTAL	2,276	4,172	1,483	2,682	386	514	3,557	6,588

*Figures in 1936 Report should be amended.

Note.—Figures for abandoned plots are deducted each year so that the first two columns are already net figures.

66. The particularly dry season experienced over the whole of the Southern Provinces was a very definite handicap to palm planting but steady and encouraging progress was maintained. In all 2416 acres were planted by 1,279 new owners. The greatest extension of the planted area was again in the Benin Province which contains 61% of the total acreage. This is particularly satisfactory in view of the delays which were caused during the early part of the season while a new system of submitting applications was being introduced. The present procedure is that intending planters apply through their village councils to the Oba of Benin, who grants a written permit to plant provided that the village council has so recommended. The objects of the system are to prevent the occupation of village land by strangers, to give security of tenure to the planter, and to

keep a record of the area of permanent crops thus ensuring that sufficient land is reserved for the cultivation of food crops. The system is in effect a beginning of a form of land registration. Permits to extend existing plots which are situated in high forest in forest reserves are obtained from the Oba through the Native Administration Forestry Department and this system is useful in that it enables us to secure a satisfactory standard of maintenance, as no permit for an extension is granted unless the existing area has been well cultivated and cared for.

67. The most pleasing feature of the year's work, though less spectacular, has been the definite progress made in certain areas which have hitherto proved difficult; thus the increasing interest of the Ibiono clan in Itu is very satisfactory as previous to 1936 no progress had been made in this area. The rapid progress in the Bende Division is also very pleasing, especially as the greatest number of planters is to be found among the Oboro clan. It was from this clan that the land for the Umuahia Experimental Station was taken, and as a result the suspicion and hostility of the people were such that for many years we could make no headway among them at all. The progress made with this clan is having its effect on the adjacent Ngwa clan. A valuable impetus was given by an educated member of this clan who, commencing in 1934, has planted an area of 150 acres at Nbawsi. In the Warri Province, among the Urhobos (Sobos) the system of communal ownership of palms is a real difficulty. But progress generally in the Province is very satisfactory and during the year the first applications ever made by Jekris and Ijaws were received.

68. It is satisfactory to note an increased interest in oil palm cultivation in the Oyo and Abeokuta Provinces which appears to be continuing. Hitherto in these Provinces it has been almost impossible to interest the farmers in anything but cocoa and all our efforts to stimulate an interest in the oil palm as an alternative crop have previously failed. In the Oyo Province in addition to twenty-four new planters, five owners extended the plots which they had planted the previous year. In Abeokuta the area planted, although still very small, was greater than in any previous year. A beginning on a very small scale was also made in the Colony. A small demonstration plot has been established at Adoni, in the Igala Division of the Kabba Province, and other plots are to be started this year with the object of encouraging the development of palm planting in this division.

PALM GROVE REPLACEMENT.

69. In the true palm belt, where there is an abundance of natural palms, palm grove replacement is undoubtedly sounder than the making of new plantations, but very little progress in this work can be reported, and prospects are not very promising. Only seven new farmers commenced grove replacement and only three undertook extensions to their existing plots. The customs relating to the ownership and harvesting of palm groves, the natural reluctance of farmers to cut down old palms, and the extra labour involved are the main factors hindering this line of work. Unfortunately few of the owners of the existing plots have followed properly our advice on maintenance, particularly with regard to the thinning of the old palms.

MAINTENANCE OF PLOTS.

70. Since 1928 when our work on oil palm planting commenced a total of 386 owners with an area of 514 acres have abandoned their plots. Lack of sustained interest is probably the chief reason for the abandonment of plots but in the Onitsha Province grass fires are also a cause, while the death of a plot owner often leads to the abandonment of his plot. The standard of maintenance is however gradually improving, and continuous extension work and the provision of demonstration plots are undoubtedly having a good effect. All demonstration plots are now entirely Native Administration or School Plots.

OIL PALM NURSERIES.

71. As a result of the efforts made in the two previous years to provide adequate supplies of selected seedlings for planters wishing to purchase them, we were able to supply a greater proportion of farmers than ever before. Some farmers still prefer to plant bush seedlings, and in the Nsukka Division of the Onitsha Province there was no demand for selected seedlings but in most areas farmers are not prepared to start planting until selected seedlings are available. We are now concentrating on an improvement in nursery technique in order to secure more rapid growth, and to prevent losses of the seedlings. In the Owerri Province there was a shortage only in the Bende Division. In Onitsha the Agricultural Officer reported that the position was satisfactory and all demands were met. This was also the case in Abeokuta and Oyo, while in Benin, owing to the rapid rate of planting, there was a definite shortage although the position was greatly improved.

The following table summarises the work done in the various nurseries :—

OIL PALM CENTRAL NURSERIES.

		Central Nurseries	Sub Nurseries	Seedlings sold 1937	Seed sown 1937	ESTIMATED	
						Seedlings ready for planting in	
						1938	1939
Benin	.. ..	4	4	4,429	1,393,000	63,200	116,000
Warri	.. ..	4	1	1,407	200,000	13,000	48,000
Owerri	.. ..	6	6 }	33,700	653,000	125,000	13,000
Calabar	.. ..	10	2 }				
Onitsha	.. ..	12	11	9,775	239,022	71,638	73,537
Ogoja	.. ..	1	2	252	9,970	949	3,011
Abeokuta	.. ..	—	9	—	64,200	14,600	10,900
Ijebu	.. ..	—	1	—	10,000	—	—

SUPPLY OF SEED.

72. I again gratefully acknowledge the assistance which Messrs. the United Africa Company Limited continued to give us ; from their Nnian estate they supplied us with no less than 1,550,000 seeds of the Lisombe type during the year. These seeds were most carefully selected and packed and sent to our various stations free of charge. The contribution of the United Africa Company to the solution of this problem in recent years has been as follows :—

1935	.. ..	300,000	seeds.
1936	.. ..	300,000	„
1937	.. ..	1,550 000	„

A further 1,950,000 seeds have been promised for 1938 and in addition a number of seedlings were supplied last year. We are also indebted to the Alake of Abeokuta who has enabled us to make use of seed from his plantation at Loburo.

GERMINATION.

73. Experiments to enable us to secure better germination of oil palm seed were actively continued ; the problem is not yet solved, for considerable fluctuation in the rate of germination still obtains. The germinators devised by the Botanist have given promising results and at Benin encouraging results were given by the use of a smoke house. At Benin in one or two lots of seed a germination of 50% in twelve months has been recorded, but the average is approximately 30% in the same period.

OIL PALM SELECTION.

74. Considerable progress was made during the year in respect of widening the field of selection. The Aba plots are now completely under our control and we have there twenty-seven acres of excellent palms which are being individually recorded. An initial selection of the trees in this area has already been made, and seed from these selected trees has been planted at the departmental farm at Benin. We have also secured an area of palms, containing an unusually high proportion of soft shelled types at Umunebo-Ufuma in the Onitsha Province. In this area yield recording and fruit analysis will shortly be commenced and we are hopeful that some superior palms will be discovered there. All hard shelled types will be removed as soon as possible and the vacant spaces will gradually be planted up with soft shelled palms from the best trees. In addition to serving as a further area for selection, the Ufuma palms are also intended to provide a source of soft shell seed for extension work during the next few years. An isolation belt, in which nothing but soft shell palms will be allowed to grow, has been left around the area. Seed will be taken from the inner area and as this seed will come from soft shell trees which are exclusively surrounded by similar trees, it may be expected to give a high proportion of trees of the soft shell type in the progeny. The United Africa Company are also helping us by undertaking to keep individual tree records of 100 acres of palms on their Ndian estate. This is at present being done entirely at their own expense, but we hope in due course that we shall be able to send a member of our African staff to Ndian in order to relieve the Company of much of the routine of this big piece of work.

PRESSES.

75. The steadily increasing popularity of the Duchscher press for extracting palm oil is shown by the figures given in the following tables :—

PALM OIL PRESSES BOUGHT BY NATIVE OWNERS.

			Culley Massa, etc.	Large Duchscher	Small Duchscher	TOTAL
At 31st December,	1932	.. ..	44	9	5	58
"	1933	.. ..	44	22	10	76
"	1934	.. ..	50	37	13	100
"	1935	.. ..	57	84	39	180
"	1936	.. ..	60	205	125	390
"	1937	.. ..	64	486	248	798
" 31st March,	1938	.. ..	64	500	255	819

Sales of Presses in each Province are as follows :—

PROVINCIAL TOTAL OF PRESSES OF ALL TYPES.

			Dec. 31 1934	Dec. 31 1935	Dec. 31 1936	Dec. 31 1937	March 31 1938
Benin	.. ..		10	17	21	28	28
Warri	.. ..		—	1	2	4	4
Owerri	.. ..		16	22	63	193	199
Calabar	.. ..		28	58	160	303	304
Onitsha	.. ..		40	76	139	202	213
Ogoja	.. ..		—	1	1	1	1
Colony	.. ..		1	1	1	1	1
Oyo	.. ..		5	5	5	5	5
			100	180	390	798	819

76. At the end of 1937 there were 789 presses in use as compared with 390 at the end of 1936 an increase of 408. The use of the press still tends to be confined to certain definite areas, which in some cases are now reaching saturation point. Thus in the Onitsha Province the presses are all concentrated in the Newi—Amichi—Ozubulu area (107) while in the Calabar and Owerri Provinces they are concentrated in the Akpabuyo and Okigwi areas respectively. There are, however, encouraging signs that a genuine interest in the press is now being taken in other areas, and we are now allowed to give press demonstrations at places where in previous years the demonstrations aroused open hostility and where the people formerly refused to provide the necessary fruit.

77. In the Owerri and Calabar Provinces there has been a satisfactory increase in the number of presses in the Bende, Uyo and Abak areas. This is interesting because in the Uyo and Abak areas the bulk of the oil normally produced is edible oil, whereas previously the use of the press was almost entirely confined to the semi oil areas. The firms are now paying a substantial premium for oil containing less than 5% F.F.A. and it is hoped that this will go a long way towards encouraging the production of better quality oil. While we are doing everything possible to popularise the use of the press we are not unmindful of the possibility of finding a still more efficient method of oil extraction suitable for the needs of this country. Enquiries are continually being made with this end in view.

78. A further point of some interest is the development by Hausa traders of a small trade in press-produced oil from the Newi area of the Onitsha area to Lagos and Abeokuta. The oil is packed in sealed petrol tins and taken across the country by motor transport. In spite of the cost of transport it is sold in Lagos and Abeokuta more cheaply than the locally made oil.

NUTCRACKERS.

79. There are no further developments to report in this connection. The model made by Mr. G. D. Crerar of the Public Works Department which was mentioned in last year's report has been carefully tested and as result it is being modified and strengthened. It has many excellent features and there is some prospect that may eventually prove a success although at a price of £15 it is still beyond the means of the ordinary producer. In districts where the press has become popular there is a real demand for a cheap but durable nut cracker.

COTTON.

NORTHERN PROVINCES.

80. Purchases of American seed cotton for export since 1928-29 expressed as bales of lint each of 400 lb. net are as follows :—

				Seed distributed Tons	Cotton bought Bales	Price paid per lb. of seed-cotton		
						s.	d.	s. d.
1925-26	..	..	..	2,990	37,356	0	2 $\frac{3}{4}$	
1926-27	..	..	..	3,372	16,659	0	1 $\frac{1}{8}$	0 1 $\frac{3}{4}$
1927-28	..	..	..	2,220	16,316	0	2 $\frac{3}{8}$	0 2 $\frac{1}{8}$
1928-29	..	..	..	2,640	24,686	0	2 $\frac{1}{4}$	0 2 $\frac{1}{8}$
1929-30	..	..	..	3,173	34,389	1	6	— 1 2
1930-31	..	..	..	2,719	13,849	0	5	— 0 8
1931-32	..	..	..	1,569	4,811	0	6	— 0 8
1932-33	..	..	..	1,674	22,228	0	8	— 0 9
1933-34	..	..	..	2,376	23,013	0	8	— 1 2
1934-35	..	..	..	3,807	50,022	1	1	— 1 5
1935-36	..	..	..	5,170	49,793	1	1	— 1 6
1936-37	..	..	..	5,170	39,272	0	8	— 1 5
1937-38	..	..	..	4,909	22,814*	0	6	— 0 8

* Estimated

81. Purchases again show a very substantial reduction as compared with last year and they are less than half those of 1935-36. While it is true that the late commencement of the rains resulted in a good deal of cotton being planted too late to produce a maximum yield yet the fall in purchases is due more to the low price than to the weather conditions. Results from our own farms show that where cotton was planted in good time the season was very favourable and yields above average were obtained.

82. It seems certain that the local weaving industry took advantage of the low price to secure a greater proportion of the crop than usual, and also that an increased quantity was exported to French Territory. Until the demand from the local industry was satiated towards the end of the season the price in the local markets was consistently higher than in the gazetted markets. Thus in most areas the local price varied from 2d. and 1½d. per pound at the start of the season and fell to 1d. and ¾d. per pound towards the end while the price offered in the gazetted markets opened at 1½d. and rose to 1d. This local industry undoubtedly does a great deal to keep the growing of cotton going in times of low world prices and is therefore of real value to the country. Production in the Zaria Province was well maintained but the purchases in the Sokoto Province fell from 15,000 bales in 1936-37 to 5,300 bales. Purchases in Northern Katsina were negligible and in Southern Katsina there was a reduction of 2,000 bales as compared with the previous season. There was also a set back in the Bauchi Province but the Niger Province showed a small increase mainly due to favourable weather conditions in the Bida Division.

EXPERIMENTAL WORK.

83. A programme of experiments to solve local problems such as the best time of planting were carried out at most of our farms. They all go to confirm the experience already gained at Maigana where cotton has been grown since 1911, that if cotton is sown in good time and is well manured the yields obtained will be satisfactory. At Bauchi for example a yield of 630 pounds per acre was obtained last season, and on block G at Maigana an average yield of between 300 and 400 pounds per acre was maintained for a period of sixteen years, i.e., from 1917-1933. The crux of the problem is manure and this can only be produced by a system of mixed farming. It can be assumed that the bulk of the farmers in the Northern Provinces will never pay much attention to the cotton crop until their food crops have been planted and established and it would be unwise to advise them to do so, but the use of cattle and implements by enabling them to cultivate the land for their food crops more quickly should also enable them to prepare land for and plant their cotton somewhat earlier. This will be genuine advance as much of the cotton is at present of necessity planted too late, even in the most favourable seasons.

IMPROVEMENT OF AMERICAN COTTON.

84. In previous reports attention has been drawn to the high yield of strain D31 and it has been pointed out that the reports from England on small samples have shown that the lint is weaker than that of the ordinary unselected cotton. In order to satisfy ourselves that this weakness is apparent when commercial quantities are dealt with, forty-nine bales of D31 which was grown at Daudawa were sent to Lancashire in 1937 and were actually sold to a mill at a premium of seventy-five points on American middling which was then valued at 6.97d. per pound. The spinners report, however, has not yet been received. The brokers who examined this cotton remarked that it was definitely weaker than ordinary Northern Nigerian Cotton but not greatly so. Meanwhile a further eighty bales has again been sent to England from Daudawa.

85. While we have every respect for and value highly the opinion of the brokers and the technical reports from the Shirley Institute our final decision as to whether a cotton is suitable for distribution to the farmers

must largely depend on the verdict of the spinners. Any appreciable loss in the various processes prior to the actual spinning, or increase in the number of breakages in the spinning process itself, will in due course undoubtedly be reflected in a reduced premium, and it is realised that no matter how desirable a cotton may be from the point of view of yield, or resistance to disease, quality must not be appreciably lowered. Hence in spite of its obvious advantages we shall not distribute D31 until we are certain that its weakness will not lower the reputation of Northern Nigerian Cotton. In the meantime D31 has been reselected and three strains have been isolated which are very promising. They retain much of the high yield of D31 and preliminary reports indicate that they are little if any weaker than the ordinary cotton.

THE DAUDAWA SEED FARM.

86. In all our work in connection with cotton we have received the utmost assistance from the Empire Cotton Growing Corporation which maintains a seed multiplication farm at Daudawa near Funtua. This assistance is very greatly appreciated. Owing to the fact that we have not in recent years succeeded in producing a really improved strain which we could with confidence distribute to farmers the Daudawa farm has not had an opportunity of performing its primary function. It has, however, rendered invaluable assistance in helping us to decide whether our strains were suitable for distribution, for in several instances the unsuitability of certain strains only became apparent when they were grown on a big scale at Daudawa. In recent years the Empire Cotton Growing Corporation has embarked on a mixed farming settlement scheme which promises to be very successful. This is pioneering work of the greatest importance to the development of Agriculture in Northern Nigeria and there is no doubt whatever that in undertaking it the Empire Cotton Growing Corporation has rendered a valuable service both to my Department and to Northern Nigeria as a whole.

SOUTHERN PROVINCES.

87. The purchases of improved Ishan Cotton for export in recent years are given in the following table.

	NATIVE COTTON		IMPROVED ISHAN	
	Bales of 400 lb. lint	Prices	Bales of 400 lb. lint	Prices
1929-30	3,510	1d. falling to $\frac{5}{8}$ d. (2)	6,026	1 $\frac{3}{8}$ d. falling to $\frac{3}{4}$ d. (1)
1930-31	312	$\frac{1}{2}$ d. „ $\frac{3}{8}$ d. (2)	4,289	$\frac{3}{4}$ d. „ $\frac{3}{8}$ d. (1)
1931-32	4	1d. „ $\frac{1}{2}$ d. (3)	1,333	$\frac{1}{2}$ d. „ $\frac{3}{8}$ d. (3)
1932-33	4	Not quoted	860	$\frac{5}{16}$ d. „ $\frac{3}{8}$ d. (3)
1933-34	118	$\frac{5}{8}$ d. (3)	2,884	$\frac{3}{4}$ d. (3)
1934-35	389	$\frac{5}{8}$ d. (3)	5,208	1 $\frac{3}{16}$ d. „ $\frac{3}{4}$ d. (3)
1935-36	444	$\frac{3}{8}$ d. rising to $\frac{3}{16}$ d. (3)	8,132	1d. rising to 1 $\frac{3}{16}$ d. (3)
1936-37	306	1d. „ 1 $\frac{1}{2}$ d. (3)	5,428	1 $\frac{1}{8}$ d. „ 1 $\frac{3}{4}$ d.

88. In view of the high price of cocoa, purchases in 1936-37 were higher than was at one time expected. Rather less seed than usual was purchased for 1937-38 season but the resultant purchases of seed cotton are likely to be about the same as in 1936-37. The low price has however retarded the rate of marketing and it is estimated that a considerable quantity is still held for a rise in price. Very little cotton passed through the markets until the middle of March.

89. In the Southern Provinces the cost of seed multiplication, of seed distribution and of the cotton markets is all met from the proceeds of the sale of seed, for which the small charge of 1d. per pound is made. The fund

is entirely managed by the Native Administrations. The Meko multiplication scheme has again given satisfactory results. 1,400 farmers planted 7,087 pounds of cotton seed and produced 229,121 pounds of seed cotton, the standard of cultivation being quite satisfactory.

CACAO.

EXPERIMENTAL WORK ON CACAO REGENERATION.

90. We have now made a definite start with our investigations on the question of cacao regeneration. At Agege we have obtained from African owners the use of four plots of approximately half acre each. One of these is a plot of young cacao which has not yet come into bearing, one is mature cacao which has not yet commenced to die back, and the other two are in various stages of degeneration. On the worst plot the cacao has almost completely died out. So far we have merely attempted to establish side shade and to fill gaps, but later on various manurial and cultural treatments will be tried. Each plot will however have to be considered on its merits. The cacao farmers in the district appear to be interested in this work and to be watching it closely. One has only to walk through some of the cacao farms in the Agege district to be convinced of the importance of it if the export of cocoa from the area is to be maintained in the future.

91. We are also attempting to obtain a fairly large area of cacao near Ibadan for the purpose of yield recording and the carrying out of cultural and manurial experiments. We are particularly anxious to test the effect of farm yard manure on cacao for it is so obvious that the best cacao is always in close proximity to compounds where it receives the benefit of household refuse, ashes, etc. This area, if it can be obtained, will also serve to widen the basis of selection for the plant breeders.

CACAO SELECTION.

92. During the last few years introductions of better quality cacaos have been made from time to time. These introductions may be summarised as follows: in 1933, seedlings were obtained from three Imperial College selection trees growing in Trinidad. Twenty-five plants are now established from the forty seedlings received. Unfortunately two of the parent trees in Trinidad have since been found to be self-incompatible, and the male parentage of the seedlings is unknown. In 1935, introductions of Criollo types from Trinidad and Ceylon were made and again it is unfortunate that the male parentage is not known. From the twenty-seven seedlings of these Criollo types fifteen have survived. Finally, in 1937, 139 seedlings from control pollinated self-compatible Imperial College Selection trees were introduced, and 127 have been planted out. Owing to the danger of introducing witches broom disease, the direct transference of pods from Trinidad to Nigeria has been out of the question. All these seedlings have therefore been germinated at Kew from pods received there, and have been forwarded to Nigeria in Wardian Cases. These cacao introductions have therefore been difficult and costly, and they have only been made possible by the closest co-operation with the authorities in Trinidad and at Kew. It is interesting to note that a number of plants of the 1933 introductions have commenced flowering and appear quite as hardy as plants of a similar age grown from seed of the West African type of cacao.

THE CAMEROONS.

93. The work of the Department in the Cameroons is still almost entirely confined to the development of the co-operative marketing of cocoa. Lack of staff precludes the possibility of further developments, but if and when the co-operative work can be taken over by the Registrar of Co-operative Societies the Agricultural Officer will be free to devote his time to purely agricultural work.

94. The Kumba Marketing Union had a successful year in spite of keen competition from the firms and middlemen, who increased their efforts to buy the cocoa direct from the farmers. The membership of the affiliated societies increased from 2,103 in 1936 to 2,335 in 1937 and the total quantity of dry cocoa sold amounted to 700 tons as compared with 470 tons in the previous season. This figure is a record, the previous highest being 640 tons in 1934-35. The increase can be attributed to the increased membership, a greater loyalty to the Union, an increased production due to new areas coming into bearing, and a good season.

95. As the village societies are scattered over a wide area in the Kumba Division, and the charges for transport, etc., vary from village to village the final payments for cocoa sold, are made only once a year. In order to enable the members to obtain ready cash the Union issues loans to its members early in the season and when the cocoa is brought in an advance up to half the value of the cocoa is made. The total advances made during the season as loans and part payments amounted to £3,857. The officer in charge of this work is very isolated from the rest of the Department, and is unable rapidly to obtain advice, or to discuss his problems with senior officers. He has therefore had to face and solve his many difficulties entirely on his own. The steady progress of the work in the Cameroons is therefore very creditable to the officers concerned.

KOLA.

96. The general improvement in produce prices in the Northern Provinces during the 1936-37 dry season was at once reflected in the price of kolas in the Southern Provinces. It also caused an appreciable increase in the imports of kolas which since 1934 had fallen to a very low level. The total railings of kolas from the Western Provinces to the North, and the imports of kolas in recent years are given below :—

<i>Railings of Kolas to the Northern Provinces</i>				<i>Imports of Kolas</i>
1932	..	..	11,020 tons	1,260 tons
1933	..	..	12,011 „	875 „
1934	..	..	17,222 „	56 „
1935	..	..	15,966 „	153 „
1936	..	..	16,290 „	385 „
1937	..	..	22,376 „	278 „

97. A recent development is in connection with the export of dried Kola. The Customs Department does not differentiate between fresh kola and dried kola in the annual figures of exports, but it can be assumed that all exports of kolas to Europe, America and Japan consist of dried kolas. The following figures summarise the position of this industry during the last three years.

EXPORTS OF DRIED KOLA.

				<i>Tons</i>	<i>Value</i>
1935	..	..	..	240	£1,183
1936	..	..	..	106	£ 460
1937	..	..	..	267	£2,171

98. The production of dried kola results in a loss of weight of approximately 75%. The local price of fresh kolas on the farm during the crop season is usually in the neighbourhood of 2s. 9d. per cwt., so that the equivalent price of dried kola should be approximately 11s. per cwt. whereas to-date the price offered by the firms for dried kola has rarely exceeded 4s. per cwt., with the result that the exports of dried kola mainly consist of the weevilled nuts which are discarded by those traders who make a practice of storing fresh kolas in order to sell them during the off season.

Owing to their inferior quality the reputation of Nigerian dried kolas on overseas markets is therefore not good. Nevertheless the trade, small as it is at present, may in the future be of considerable interest to Nigeria.

GROUNDNUTS.

IMPROVEMENT OF GROUNDNUTS.

99. The strain "Castle Cary" which was produced by the Botanist a few years ago is definitely popular with the farmers and its cultivation steadily increasing. It is an upright type, and the yield of hay is considerably better than that of the ordinary unselected type, a very important matter for the mixed farmer. Numerous tests have shown that the yield of nuts is slightly higher than that of the ordinary types and the Chemist has proved conclusively that the oil content is satisfactory. It is grown each year on all farm centres and demonstration farms and the resultant seed is sold to local farmers. Its popularity is shown by the following report from the Agricultural Officer, Katsina: "Castle Cary groundnut seed was sold at 4s. 6d. per bag last year and at 4s. per bag this year. The canteen price of the same bag would be 2s. 6d. or 3s. In other words there is a keen demand for Castle Cary seed at prices well above current market rates." The Botanist is continuing the work of selection for other superior strains, and both at Samaru and Kano he has strains which in preliminary tests have shown themselves to be as good or better than Castle Cary.

ROSETTE DISEASE.

100. Rosette disease has always been reported from the Kano Province, but in recent years reports have indicated that it is tending to increase. Its incidence undoubtedly varies from year to year, but in years when the incidence is heavy it causes a considerable reduction in yield. An experiment has been started at Kano, which will be repeated for several years, to ascertain whether the disease can be kept in check by cultural methods, and particularly whether its spread is facilitated by clean weeding. The results obtained in the first year are of some interest, and are given below:—

Average yield of nine clean weeded plots	Nuts 760 lb. per acre (dry decorticated nuts) Hay 1,264 " " "
Average decrease of four unweeded plots	Nuts—357+ 68 lb. per acre Hay —562+107 " " "
Average decrease of four plots weeded until the plants were well established	Nuts—20+ 68 lb. per acre Hay —70+107 " " "

The incidence of the disease is shown by the following figures:—

AVERAGE NUMBER OF ROSETTED PLANTS PER ACRE.

Treatment	30.8.37	8.9.37	15.9.37	2.10.37	8.10.37
Clean weeded plots	25.3	84	136	155.2	161
Unweeded plots	109	105	75	85	58
Plots weeded till established	20	97	107	126	127

These results indicate that while little advantage is gained by expending labour in weeding after the plants are well established, yet the heavy growth of weeds in the unweeded plots depressed the yield considerably. The incidence of rosette disease was not heavy but it does seem that while the disease tended to spread in the weeded plots it decreased in the unweeded plots. It is interesting to note that the affected plants in the clean plots tended to grow past the disease when the rainfall was good, others being infected in their turn, whereas in the unweeded plots they seemed to remain stunted for longer periods, but the disease did not spread.

BENNISEED.

101. Although the area planted with Benniseed in the Benue Province was probably greater than in 1936 owing to a light and unevenly distributed early rainfall the total crop amounted to only 11,500 tons as compared with the record of 13,000 tons in the previous year. The opening price was £7 per ton at the river stations but it fell to £6 per ton before the end of the season, and for the 1938 season will probably be lower still.

102. As the Tiv country is very thickly populated and as there is a real land shortage our efforts have been concentrated upon increasing production by more intensive cultivation rather than upon an increase in area. The intensive propaganda to persuade the people to weed and thin their benniseed which was started in 1936 in three family groups of the Tsambe clan has proved such a success that the scheme will now be extended to the remaining seven family groups in 1938. Cultivators outside the area in which we have been working have started to adopt our methods on their own, and in some cases have asked for advice and assistance. The extra yield obtained by the adoption of our advice is not less than 75%. Similar work in the neighbourhood of Yandev is likely to be equally successful, but is proceeding more slowly as in this area the land shortage is not so acute.

RICE.

RICE GROWING IN MANGROVE SWAMPS.

103. In November, 1936, it was found possible to post an officer permanently to the Warri Province to study in detail the problems connected with this important piece of work, and as a result many difficulties have come to light. In Sierra Leone rice growing in tidal swamps has long been successfully established and we have hopes that we shall eventually be equally successful in Nigeria, so making a useful contribution to the food supply of the country.

104. Particular attention has this year been paid to the experimental work and every effort has been made to reduce the costs of production. From the results so far obtained it seems that, unlike experience in Sierra Leone, there is a serious fall in yield after the first year. The yields from the plots in the Warri swamp were lower than those of the two previous years. It is early yet to say whether yields will continue to fall but on the poor swamp there is some indication that a uniform level was reached in the third year. Our experiments also show that if after the mangrove forest has been felled the land is allowed to lie fallow for two years the yield of the first crop will be greater than if it is only allowed one year's fallow. It is clear, however, that this increase in yield does not compensate for the loss of a year's crop. Another difficulty which has arisen is that at Warri on some plots scour resulting in the loss of good soil is being caused by the ebb tide and it is probable that some form of water control will be necessary. Also the particular variety which we are growing namely, G.E.B.24, seems very liable both to lodging and to "blast" disease. While we are hopeful that these difficulties can be overcome we feel that we still have much to learn from Sierra Leone. It has therefore been arranged that the officer in charge of this work shall visit Sierra Leone in order to study the work being done on the Rice Experiment Station there on his return from leave.

105. The most notable development during the year has been the introduction of the "Kesaran", a hand operated rice huller, from Malaya. We are indebted to Mr. Faulkner for kindly suggesting this machine to us. The original machine which was received from Malaya was constructed of basket ware, baked clay and coconut fibre. The hulling surfaces consisted of wooden chips set in baked clay. In Malaya the cost of this device is about £2. When tested at Warri it was found to be very efficient but the local people were unable to copy it exactly. A number of modified forms of the Kesaran have however been made by the Agricultural Officer at Warri

and the final product is cheaper, more efficient and easier to make than the original. Any rice farmer can now make his own rice huller from a mangrove log at a cost of about 5s. A small English huller costing about £3 10s. landed at Warri, was found to be difficult to operate and less efficient than the locally made machine. The labour involved in hulling rice in a pestle and mortar is a handicap to rice growing throughout Nigeria and we therefore propose to test the modified Kesaran in other areas where rice is normally grown. It certainly overcomes one of the main difficulties encountered in the Warri area.

106. In view of the many problems involved extension work has naturally been slow and we have made no effort to force the pace. All the farmers who grew rice this year propose to continue in 1938 and in addition eleven new Jekri farmers and five Urhobos (Sobos) have cleared swamp in readiness for the 1938 season. The total number of farmers intending to plant in 1938 will therefore be thirty-seven as against twenty-one in 1937.

THE SOKOTO RICE MILL.

107. It has been decided that the rice mill shall be closed down in September, 1938, for although the quality of the rice is now satisfactory, owing to the high price which we invariably have to pay for paddy and the distance of Sokoto from the main consuming markets it seems unlikely that it will ever be possible to make it a profitable enterprise. It is also doubtful whether it has done anything to encourage the production of rice in its immediate vicinity. As an adjunct to the Kworre Irrigation scheme it has been most useful, but even in this connection its usefulness will be considerably less if the "Kesaran" is as successful at Kworre as it has been at Warri.

GINGER.

PRODUCTION FOR EXPORT.

108. There was again a small but not serious decrease in the production of ginger for export the total quantity amounting to 317 tons as compared with 342 tons in 1936-37. In view of the difficulties with which the industry was faced this year 317 tons is a very satisfactory figure. The export figures do not nowadays represent total production for in addition there is a steadily growing internal trade in fresh ginger. The extent of this trade can be judged from the fact that during the seven months September to March, 285 tons of fresh ginger were railed from stations in Southern Zaria and railings still continue. A further quantity is normally carried North on donkeys during the dry season so that it is probable that the export of fresh ginger from Southern Zaria which is absorbed within Nigeria is not less than 400 tons.

109. The progress of the industry since its commencement is shown by the following figures :—

1930-31	..	..	..	..	15 tons.
1931-32	..	..	..	..	39 "
1932-33	..	..	..	..	53 "
1933-34	..	..	..	..	86 "
1934-35	..	..	..	..	221 "
1935-36	..	..	..	..	378 "
1936-37	..	..	..	..	342 "
1937-38	..	..	..	..	317 "

The prices paid this season compared with those of the previous seasons were as follows in pence per lb. :—

			<i>Grade II</i>	<i>Grade III</i>	<i>Grade IV</i>
1935-36	..	..	3½	3	1½
			<i>Special</i>	<i>Grade I</i>	<i>Grade II</i>
1936-37	..	..	4½	3	2
1937-38	..	..	3½	2½	2

As some 60% of the crop is Grade I the reduction in price of half-penny per lb. for this grade made a big difference to the total amount paid to the producers which fell from £8,456 in 1936-37 to £6,821 in 1937-38. In the Jaba area the average value of the crop per tax payer was 33s. as compared with 39s. last year.

110. The same three companies namely the United Africa Company, John Holt and Company and G. B. Ollivant, Limited again competed for the crop and the prices paid by all companies were the same throughout. Special grade was bought by one firm during the earlier markets. This firm handed over to another for the later markets and the price was raised to 4d. per lb. but very little ginger was purchased at this price. An unsatisfactory feature of the marketing was the great increase of the number of middlemen operating in and around the markets. These middlemen were prepared to steal or buy grading tickets from the producers, and to pay the latter to take the ginger into the markets. It is clear that the time has now come when regulations must be introduced to control the activities of these men.

111. The real problem which arose just before the buying season commenced was in respect of one aspect of the term "quality" which came as a complete surprise to us. In July, 1937, we were informed by both the Imperial Institute and by the firms that Nigerian ginger on analysis was found to be deficient in both "water soluble extract" and Ash soluble in water. Ginger is sold in the United Kingdom on the standards laid down by the British Pharmacopoeia which are as follows :—

<i>Water soluble extract</i>	<i>Total Ash</i>	<i>Ash soluble in water</i>
Not less than 10%	Not more than 6%	Not less than 1.7%

Figures kindly supplied by the Imperial Institute showed the following analyses for Nigerian ginger produced in recent years :—

	<i>Water soluble extract</i>	<i>Total Ash</i>	<i>Ash soluble in water</i>
1935 crop, Grade III	9.5%	2.7	1.1
1936 " " "	7.1%	1.9	0.2
1937 " " "	9.7%	2.7	1.0

These figures showed that Nigerian ginger was seriously deficient in cold water extract and water soluble ash and from other figures available to us it was clear that the deterioration in recent years had become progressive. Nigerian ginger had in fact become what is known as exhausted ginger. It is not therefore surprising that we were informed later that retailers in England had been prosecuted for selling our ginger and that unless this state of affairs could be rectified the English market would be closed to Nigerian ginger.

112. In co-operation with the Imperial Institute the whole question was most carefully examined and experiments produced the following information :—

- i. There is no deficiency in the composition of the ginger when harvested. A typical analysis of dried unpeeled ginger being as follows :—

<i>Cold water extract</i>	<i>Water soluble Ash</i>
17.76%	6.36%

- ii. The method of preparation advocated by the Department gives satisfactory results.
- iii. The soaking of freshly peeled undried ginger does not cause any appreciable loss of water soluble constituents.
- iv. Soaking in water after the ginger has once been peeled and dried causes rapid leaching of the soluble constituents.

113. It was therefore proved that the trouble was due to faulty preparation and this was confirmed when an analysis was made of ginger cured by a native by his own method. This man soaked his dried ginger for 13½ hours between the first and second washing. It has now transpired that in order to obtain a good colour the producers had departed from the method advocated by the Department and had adopted the system of soaking the dried ginger overnight. This method produces the necessary white colour but is the cause of the unsatisfactory analysis.

114. As soon as these results were available we immediately started intensive propaganda. Demonstrations of the correct method of preparation were given in each village area, and in many villages each house was visited by an Agricultural Officer. This was followed by house to house visits by the African Staff, and as cured ginger was available samples were taken in each village area, and later on during each day of the markets. These samples were forwarded to the Chemist for analysis and the results were communicated to the buying firms. The time available for this work was extremely short and while every possible effort was made to ensure that the approved method was adopted it was of course impossible to supervise the washing of every basket of ginger from some 20,000 producers.

115. As a result of these efforts a great improvement was effected. Almost all the ginger from the Kachia area which represents 54% of the crop and in which the supervision was most adequate, was up to the standard, while the average of the Kachia and Zonkwa markets which amounts to 93% of the crop gave the following analysis. Figures for last year's crop, as supplied by brokers, are given for comparison :—

		<i>Cold water extract</i>	<i>Water soluble Ash</i>
This year	..	11.73%	1.49%
Last	,,	5.30%	0.66%

116. Although this improvement was effected in the analysis of the ginger a certain amount of deterioration in colour also resulted. This is reflected in the grading figures, the grading being based entirely on colour and boldness. The grading of the crop for the last four years expressed as percentages of the whole crop is given below :—

			<i>Grade II</i>	<i>Grade III</i>	<i>Grade IV</i>
1934-35	..	..	5%	77%	17%
1935-36	..	..	2%	64%	33%
			<i>Special</i>	<i>Grade I</i>	<i>Grade II</i>
1936-37	..	..	1%	72%	27%
1937-38	..	..	0.5%	58.7%	40.7%

117. The improvement so far effected is very creditable to the officers concerned but more remains to be done as the content of soluble ash in the crop as a whole is not yet entirely satisfactory. While there is little doubt, however, that this will be rectified by continued intensive propaganda, fortunately a further effective solution seems to be available. Mention was made in last year's report of a new type of yellow ginger that had been discovered by us. This yellow ginger has an excellent analysis, has been well reported upon by the Imperial Institute and has the great advantage that it cures very quickly with a minimum amount of washing. Every effort is being made to multiply this type as quickly as possible and it is hoped that we shall have a sufficient quantity of seed to enable us to commence distribution in 1940.

118. As a result of our analyses of fresh ginger there is some evidence that there is a correlation between the phosphate content of the fresh ginger and the water soluble ash in the cured product. It is also evident that ginger makes a heavy demand on the available phosphate in the soil. Manurial trials in several villages will therefore be carried out this year.

THE FRUIT INDUSTRY.

119. Experience shows that the establishment of an export trade in fruit is by no means easy and is fraught with difficulties. Apart from difficulties such as low prices, pests and diseases, and finding a suitable market there is the difficulty of dealing with fruit which is not quite suitable for export on account of size or blemishes. The export market will accept only the very best, and a large proportion of the fruit produced, no matter of what variety, fails to reach the necessary standard. A fruit industry can therefore be developed only if some means can be found of profitably disposing of such fruit. The two possible outlets for fruit which is not up to export standard is by the establishment of a juice industry and by local consumption. As both these outlets have distinct possibilities we shall continue to persevere with our attempts to develop a fruit-growing industry in certain parts of the Southern Provinces.

120. The position with regard to the internal trade in fruit is shown by the figures given below :—

CONSIGNMENTS OF FRUIT FROM RAILWAY STATIONS IN THE ABEOKUTA AND OYO PROVINCES TO THE NORTH IN APRIL 1ST, 1937, TO MARCH 31ST, 1938.

Coconuts	..	..	..	3 tons, 13 cwt.
Oranges	..	..	..	18 „ 8 „
Bananas	..	..	..	3 „ 8 „
Pineapples	..	..	..	8 „ 5 „
Mixed Consignments	..	..	..	11 „ 0 „

RAILINGS OF ORANGES FROM THE OWERRI PROVINCE TO THE NORTH (JANUARY TO DECEMBER).

1934	..	..	..	170 tons, 14 cwt.
1935	..	..	..	203 „ 2 „
1936	..	..	..	350 „ 18 „
1937	..	..	..	490 „ 0 „

(A few consignments consist of mixed fruits but 90% of the total tonnage consists of oranges).

Most of this fruit goes to Kano, Nguru and Jos and there is plenty of scope for the further extension of this trade, which is so desirable from the point of view of human nutrition. It is being closely watched by the Agricultural Officers concerned and every possible encouragement is being given to it.

FRUIT JUICES.

121. Although this work was started primarily with a view to establishing a complementary industry to the export trade in fresh fruit, results have recently been sufficiently encouraging to indicate that so far as oranges are concerned the prospects of the juice trade are more hopeful than those of the trade in fresh fruit. Whilst we have not reached the stage where we can definitely recommend planting oranges for juice extraction, there are various districts in the Southern Provinces where supplies of fruit are believed to be considerable and it is in such areas that we hope to develop the business a stage further. If, however, the industry is to be developed some form of machinery will have to be introduced. Enquiries on this point have already been instituted, and the possibilities of the market are also being investigated. In addition to orange juice, shipments of grapefruit and lemon juices have also been made with considerable success. Whilst supplies of grapefruit are expected to increase in quantity in future as a result of the planting which is taking place there are at present no lemons available in sufficient quantity to enable a trade in this class of juice to be developed, but some extension in the cultivation of this crop is under consideration.

122. Up to the present the preparation of all shipments has been carried out by a contractor working under the close supervision of the Department who has purchased the whole of the surplus orange, grapefruit and lemon crops from Agege farm. Extraction has been carried out in accordance with a simple technique worked out by the Department. The containers have been supplied by the exporting firm which has purchased the juices at fixed rates per gallon delivered Lagos. The respective costs of production per gallon are recorded below :—

Class of Fruit	Average No. required per gallon	Price paid per gallon Lagos	Estimated cost of production per gallon	Estimated profit per gallon
Oranges ..	40	10d.	6d.	4d.
Grapefruit ..	36	1s. 2d.	8½d.	5½d.
Lemons ..	67	8d.	5½d.	2½d.

123. The most recent development has been in connection with an experimental shipment of pineapple juice which was prepared by this Department. Considerable difficulty was experienced in finding a market for this product but enquiries have recently been received for pineapple pulp for which there appears to be a more promising field for development. The technique of preparation and preservation is at present being investigated and trial shipments will be made at the earliest opportunity.

FRUIT PIERCING MOTHS.

124. In connection with our citrus work some mention must be made of the damage caused by fruit piercing moths. The Senior Entomologist who has been investigating this matter reports that between April and June, 1937, Noctuid moths chiefly *Achaca spp.* achieved the status of major pests of citrus for the first time in Nigeria, and caused the loss of about 70% of the fruit crop on Moor Plantation. The moths did not appear in the autumn, but arrived again in considerable numbers early in April, 1938. Fruit piercing moths are also a serious pest on the Gold Coast, but whereas the Entomologist in the Gold Coast attributes almost all the damage to *Othaeis spp.* this species is so far rare at Ibadan. Control is being attempted by the use of traps of the Gunn type which have been successful in South Africa, and by means of poisoned mangoes as it has been noticed that *Achaca spp.* prefer mangoes to either grapefruit or oranges. The Gunn traps have so far been ineffective. The Senior Entomologist suggests that this infestation can hardly be attributed to the increase in the area under citrus fruit at Moor Plantation, as similar outbreaks on a smaller scale were recorded in 1920 and in two years between 1922 and 1930. He points out that fruits are merely the food of the adult instar and suggests that the factors limiting the abundance of these moths must be looked for during larval egg, of pupal instars. His investigations will be continued, and in the meantime the possible effect of this pest on the economics of fruit growing is being carefully watched. All intending planters are now warned that fruit moths may in any year destroy a high proportion of their early crop.

EXPORT OF ORANGES AND GRAPEFRUIT.

125. While as pointed out above there are real possibilities for the development of the internal trade in oranges and possibly of an export trade in orange juice the outlook for developing an export trade in green oranges is not so promising. The whole question has been very fully investigated in recent years and experience has shown that our green oranges can be sold at a profit only when owing to temporary and fortuitous circumstances there is a shortage of supplies from other sources. Under such conditions African exporters would be certain to sustain losses which they would be unable to bear. Although we have introduced several varieties of oranges from other countries none of them seem to be outstanding or particularly promising. While we intend to continue to assist anyone who wishes to

export oranges we cannot regard this line of work as of real importance, and we do not propose to attempt any further development until a superior type of orange has been found which is likely to meet the requirements of overseas markets.

126. There is still a considerable demand for grapefruit trees for planting and material is available to meet this demand, but all would-be planters are warned both of the danger of losses through fruit moths and of the doubtful state of the market. There is a limited local demand for grapefruit in the vicinity of Lagos and other big towns which comes mostly from Europeans, and there is still room for an extension of the area planted in order to meet this demand, but the time is not yet ripe for extension on a big scale for export purposes. A trial shipment of fruit from the Agege farm was made this year to the Overseas Farmers Co-operative Federation. The fruit was satisfactory from the point of view of thinness of skin and absence of seeds but the external appearance was unfavourably commented upon; it was, however, the first crop from young trees and it is possible that the appearance of future crops will show some improvement.

EXPORT OF PINEAPPLES.

127. The pineapple export trade has made steady progress since its inception in 1931, but there are still certain difficulties. The considerable improvement which has been effected in the condition of the fruit on arrival at its destination overseas has only been achieved as a result of vigorous selection at the time of inspection. It is now known that most of the wastage which has occurred in past years can be attributed to the effects of the dry season which renders the fruit unsuitable for shipment. In consequence, farmers have been able to market only a small percentage of their crop and have suffered disappointment on occasions when it has been considered necessary to suspend export entirely. In addition, the trade during the past few years has been carried on entirely by African exporters whose activities have been extremely spasmodic. Until export is again resumed by one of the trading firms prepared to develop the business on a more regular basis, there is little likelihood of any further substantial progress.

128. For the successful establishment of the industry it is essential that a market be found for the whole, or the greater part, of the farmers' crop. Even if the present dry season wastage problem is successfully overcome shipments will continue to be restricted to the fortnightly intervals corresponding with the departure of the mail steamers, and much of the fruit maturing between these periods cannot at present be disposed of locally to profitable advantage. The establishment of a subsidiary industry which would absorb the surplus crop is of the utmost importance to the trade. The most promising line of development at the moment appears to be an export industry in pineapple pulp to which reference has been made in paragraph 123. If this proves successful farmers will have much more inducement to take up the cultivation of the pineapple crop on a more extensive scale. This would not only increase the supply of fruit available for the export market but should also widen considerably the field for selection thereby improving still further the standard of quality for the export market.

129. The following figures summarise the development of the trade during the period 1931-37 inclusive (August 1st to July 31st).

Seasonal year				No. of exporters	No. of cases	No. of fruits.
1931-32	..	..	..	3	568	2,161
1932-33	..	..	..	4	172	1,260
1933-34	..	..	..	12	887	4,659
1934-35	..	..	..	8	306	2,705
1935-36	..	..	..	4	636	6,278
1936-37	..	..	..	5	698	9,100
1937-38	..	..	..	1	20	400 (to the end of March, 1938)

Experimental work at Agege is being continued. Special attention is at present being given to the control of dry season wastage and to the control of wilt disease.

THE IMPERIAL INSTITUTE.

130. I wish to take this opportunity of recording my appreciation of the great assistance we have received from the staff of the Imperial Institute throughout the year, not only in connection with ginger, but also in connection with some of the problems arising out of the inspection of ground-nuts. Their advice and help has been of great value to my Department.

APPENDICES.

131. Appendix I gives details of Agricultural Legislation enacted during the year and, a financial statement is given in Appendix II.

J. R. MACKIE,
Director.

APPENDIX I.

AGRICULTURAL LEGISLATION PASSED DURING THE PERIOD
1ST APRIL, 1937 TO 31ST MARCH, 1938.

Regulations No. 43 of 1937. Previous to 1935 the marketing and grading of cotton was controlled under Regulations No. 37 of 1926. In 1935 new regulations, No. 25 of 1935, were introduced to deal with the creation of market and buying areas in the Northern Provinces, the appointment of an Advisory Committee, the introduction of scale fees and the licensing of buyers. These Regulations applied only to the Northern Provinces and were additional to the Regulations No. 37 of 1926. As it was extremely inconvenient to have two sets of regulations dealing with the same subject they have now been combined under Regulations No. 43 of 1937. The latter made no important changes in the system of marketing but the opportunity was taken to make several minor alterations to the wording and to clarify the position with regard to search, seizure and arrest.

APPENDIX II.

		£	s.	d.	£	s.	d.
	Personal Emoluments, Main Branch	59,410	11	4			
33.	Transport Allowances	4,498	19	7			
34.	„ General	1,132	13	10			
35.	„ Railway	4,566	12	5			
36.	Travelling Allowances	1,090	9	5			
37.	Telephones	185	11	7			
38.	Stationery	222	14	9			
39.	Contingencies	37	3	0			
40.	Books and Periodicals	202	12	10			
41.	Uniforms	9	4	1			
42.	Artisans, Overseers and Pupils ..	934	5	8			
43.	Labour	7,778	8	6			
44.	Poultry Farms	201	5	0			
45.	Development of Cotton Industry ..	129	10	5			
46.	Farming Equipment	1,892	13	8			
47.	Rent and Compensation	6	18	11			
48.	Upkeep of laboratories	615	13	2			
49.	Palm Oil Extension Work	2,251	8	10			
50.	Cocoa Extension Work	119	14	11			
51.	School Equipment	79	10	5			
52.	Development of Fruit Trade ..	6	4	0			
53.	Water Supply, Nasarawa Farm ..	24	12	10			
54.	Hostel Charges	73	1	7			
55.	Sokoto Rice Mill	922	9	11			
					86,392	10	8

PRODUCE INSPECTION.

	Personal Emoluments	29,569	7	6
56.	Passages	1,219	5	6
57.	Transport Allowances	1,479	5	0
58.	„ General	899	4	10
59.	„ Railway	558	2	5
	Carried forward	£33,725	5	3

	£	s.	d.	£	s.	d.
Brought forward ..	33,725	5	3			
60. Travelling Allowances	207	19	3			
61. Rent	63	16	0			
62. Seals and Presses	3,416	11	3			
63. Stationery	130	16	6			
64. Temporary Buildings	1,120	4	11			
65. Contingencies	33	3	0			
66. Bush Allowances	96	13	5			
67. Upkeep of Launch	729	3	4			
68. Telephones	136	0	5			
69. Produce Testing Apparatus ..	15	10	7			
70. Provident Fund, Bonus, etc. ..	1,021	12	9			
71. Colonial Charges	916	18	2			
71a. Uniforms	283	18	10			
				41,897	13	8

SPECIAL EXPENDITURE.

72. Typewriters for Produce Inspectors	15	5	9			
73. Construction, etc. Ilorin Stock Farm	160	1	4			
74. Maintenance of Buildings and Improvements	49	12	2			
75. Drugs and Stores	49	7	1			
76. Unit Farms	200	18	3			
77. Arrears of Maintenance, Government Farms	1,450	13	0			
				1,925	17	7
GRAND TOTAL				£130,216	1	11

Statement of Revenue under Agriculture: 1937-38.

	£	s.	d.	£	s.	d.
Head 2.— <i>Fees of Court, etc.</i>						
Item 17. Produce Inspection ..	49,982	9	3			
„ 18. Overtime and rebagging ..	727	13	10			
				50,710	3	1
Head 8.— <i>Earnings, etc.</i>						
Item 8. Agricultural produce ..	1,098	15	9			
„ 18. Rice : Sokoto Rice	914	2	2			
				2,012	17	11
Head 13.— <i>Reimbursements.</i>						
Item 6. Agriculture				6,891	11	4
				£59,614	12	4

